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CONTAMINATION ASSESSMENT REPORT FOR SITE G300 WITH TRANSMITTAL CSS
PANAMA CITY FL
8/1/1997
BROWN AND ROOT ENVIRONMENTAL

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08/04/97

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Contamination Assessment Report

for

Site G300

at

Coastal Systems Station

Panama City, Florida



Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0027

August 1997

CONTAMINATION ASSESSMENT REPORT
FOR SITE G300

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

REC'D AUG 25 1997

Submitted to:
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Naval Facilities Engineering Command
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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0027

AUGUST 1997

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11 August, 1997

Project Number 7540

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Reference: Clean Contract No. N62467-94-D0888
Contract Task Order No. 0027

Subject: Contamination Assessment Report for
Site G300, Coastal Systems Station
Panama City, Florida

Dear Mr. Mitchell:

On behalf of the Department of the Navy, Southern Division, Naval Facilities Engineering Command, (SOUTHDIV), Brown & Root Environmental is pleased to submit for your review and approval, two copies of the Contamination Assessment Report (CAR) for Site G300, Coastal Systems Station.

If you have any questions regarding this assessment or require additional information, please contact me at (904) 656-5458.

Very truly yours,

Paul E. Calligan, P.G.
Task Order Manager

PC/wm

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EXECUTIVE SUMMARY

Brown & Root Environmental (B&R Environmental) has completed a Contamination Assessment (CA) at the above-referenced facility in accordance with the requirements of Chapter 62-770, Florida Administrative Code (FAC). The assessment report was submitted to the Florida Department of Environmental Protection (FDEP) for approval.

B&R Environmental performed the following tasks during the CA:

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, to evaluate private potable wells in a 0.25-mile radius and public water supply wells within a 0.50-mile radius, to locate nearby surface water bodies, and to determine surface hydrology and drainage;
- Reviewed previously prepared Closure Assessment for Tank G300 to determine appropriate boring locations and monitoring well placements;
- Conducted site survey to identify utilities and to construct a site plan;
- Performed direct push investigation which included the installation of 15 soil borings for collecting soil and groundwater samples for field screening of total petroleum hydrocarbons - diesel range organics (TPH-DRO) using a gas chromatograph.
- Installed four shallow permanent monitoring wells to approximately 15 feet below land surface (bls) and installed four shallow piezometer wells to approximately 14 feet bls.
- Collected groundwater samples from the permanent monitoring wells for laboratory analysis of the Kerosene Analytical Group parameters;
- Collected three soil samples for laboratory analysis of the Kerosene Analytical Group parameters;
- Surveyed monitoring well top of casing elevations and collected depth to groundwater measurements to evaluate the groundwater flow direction and gradient;
- Performed slug testing on three monitoring wells to evaluate the hydraulic conductivity of the surficial aquifer; and

Laboratory analytical results for groundwater samples indicate that the dissolved hydrocarbon concentrations meet the criteria established for No Further Action (NFA), as established in the FDEP's, October 1990, "No Further Action and Monitoring Only Guidelines for Petroleum Contaminated Sites", for all constituents of the Kerosene Analytical Group.

Evaluation of soil assessment data indicates that "excessively contaminated" soil, as defined by Chapter 62-770.200, FAC, is present at the site. The areal extent of the excessively contaminated soil is limited to

a small area adjacent to the southwest corner of building 300, and extends approximately 3 to 4 feet below the building footer. The proximity to the building footer makes it impracticable to remove the soil without adversely impacting the structural integrity of the building.

Although the dissolved hydrocarbon concentrations meet the criteria established for NFA, the site does not qualify for NFA due to the presence of excessively contaminated soil. Since it is impracticable to remove the excessively contaminated soil, it is recommended that a Monitoring Only Program (MOP) be implemented at the site. The MOP should include 6 months of monitoring for Total Volatile Organics and Polynuclear Aromatic Hydrocarbons.

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

A Contamination Assessment (CA) was conducted by Brown and Root Environmental (B&R Environmental) for the US Navy (Navy) Southern Division Naval Facilities Engineering Command under Contract Task Order 0008, for the Comprehensive Long-term Environmental Action Navy (CLEAN III), Contract Number N62467-94-D-0888. The CA was conducted at Site G300 located at the Coastal Systems Station (CSS) in Panama City, Florida. The Florida Department of Environmental Protection (FDEP) Facility Identification Number is 038518667.

The purpose of this CA was to determine the nature and extent of petroleum hydrocarbon impacted soil and groundwater in accordance with the requirements of Chapter 62-770, Florida Administrative Code (FAC). On September 16, 1996, a discharge of diesel fuel to the ground surface was identified near the vent lines of a 150-gallon day tank used to store diesel fuel for a generator in Building 300. The discharge was identified by an inspector from the FDEP who was at the facility to oversee the removal of a 2,500-gallon underground storage tank (UST), which supplied diesel fuel to the day tank. A Discharge Notification Form was submitted to the FDEP by the CSS Environmental Department on September 17, 1996 and is included in Appendix A.

An Initial Remedial Action (IRA) was conducted to remove "excessively contaminated soil," as defined by Chapter 62-770, FAC, near the vent line for the day tank, however, the IRA was abandoned on September 23, 1996 after it became apparent that the amount of "excessively contaminated soil" may have been the result of various day tank overfills since 1972. Correspondences from the CSS Environmental Department concerning IRA removal activities are included in Appendix A. The 2,500-gallon diesel UST which had supplied diesel fuel to the day tank was removed on September 17, 1997. A Tank Closure Assessment Report was completed for the removal of the diesel UST and is provided in Appendix B.

A CAR Summary Sheet, as required by Chapter 62-770, FAC is included in Appendix C.

1.2 SITE DESCRIPTION

1.2.1 Location

The CSS facility is located on the western shore of St. Andrew Bay in Panama City, Bay County, Florida. The facility is bounded by US Highway 98 to the north, St. Andrew Bay to the east, State Road 292B (Magnolia Beach Road) to the south, and State Road 292 (Thomas Drive) to the west as shown on Figure 1-1. Specifically, the CSS facility is located within Section 33 of Township 3 South, Range 15 West and Section 4 of Township 4 South, Range 15 West, as shown on United States Geological Survey (USGS) Panama City Beach, 7.5 Minute Series Quadrangle and presented as Figure 1-2.

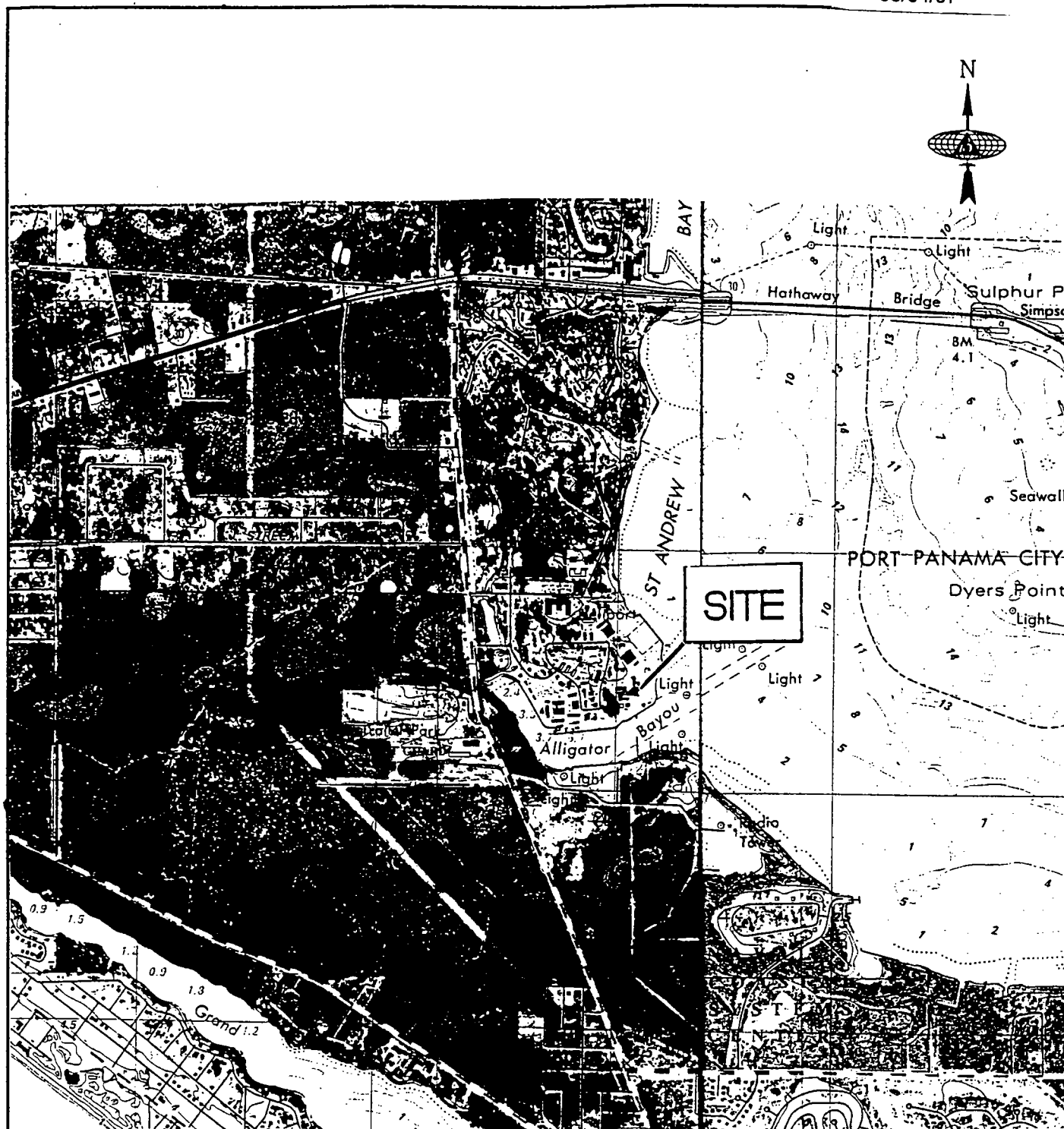
1.2.2 Topography and Drainage

The topography at the site is relatively flat with a ground surface which gently slopes towards the west. The site is located at an elevation of approximately 12 feet above National Geodetic Vertical Datum (NGVD). Locally, the ground surface grades toward Alligator Bayou located approximately 350 feet south of the former diesel underground storage tank (UST) system for Building 300. The altitude of the ground surface decreases by approximately 10 feet from Building 300 to Alligator Bayou.

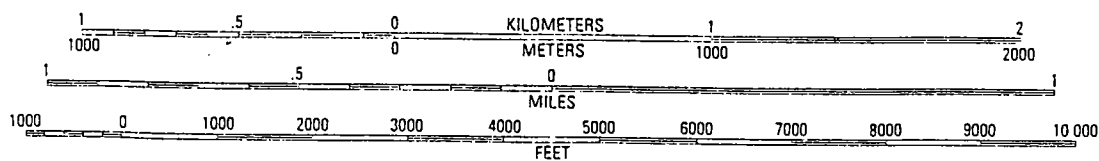
The land surface at the area of the former diesel UST has a grass surface cover which allows rainfall to infiltrate into the subsurface. Precipitation run off drains toward a storm drain located approximately 60 feet northwest of the site. The nearest surface water body to the site is Alligator Bayou which is located approximately 350 feet south of the former diesel UST. Alligator Bayou is designated as a Class III surface water by the State of Florida, suitable for fish and wildlife propagation and water sports (ABB Environmental Services Inc., RCRA Facility Investigation (RFI) Report. 1995).

1.2.3 Regional Hydrogeology

The regional hydrogeology of CSS Panama City is described in the RFI Report (ABB Environmental Services, Inc., 1995). According to this report, surficial deposits at CSS are Pleistocene to Recent coastal plain sediments of marine and estuarine origin. They predominately consist of quartz sand, clayey sand, and gravel. These deposits vary in thickness from 70 to 100 feet in Bay County. The surficial aquifer is located within these deposits. Underlying the surficial deposits is the Intercoastal Formation of middle Miocene to late Pliocene. The Intercoastal Formation is composed of sand and poorly consolidated limestone interbedded with discontinuous clay and low permeability sandy limestone. This formation is



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FIGURE 1-2
SITE LOCATION
SITE G300

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

approximately 150 feet thick at CSS Panama City. The lower beds of the Intercoastal Formation are part of the Floridan aquifer system.

Groundwater at CSS occurs in two major aquifer systems: unconfined surficial aquifer and the Floridan aquifer system, which is under confined and artesian conditions. A third semi-confined aquifer exists in thin permeable sand and shell zones within the Intracoastal Formation, and is separated from the water table aquifer and from the Floridan aquifer system by interbedded low-permeability clay and limestone. The Intercoastal Formation does not produce enough water to be considered a significant water source. The Floridan aquifer is under confined and artesian conditions where low-permeable clays and limestone beds of the Intracoastal Formation separate the water table aquifer from the Floridan aquifer. The surficial aquifer is reported to have insufficient thickness to produce significant quantities of water and its quality is generally undesirable for human use (i.e., dissolved solids, acidity, and iron content). Low permeability clay lenses in the surficial aquifer and the Intercoastal Formation are discontinuous. The surficial aquifer may be hydraulically connected to the Floridan aquifer system through semiconfining strata of the Intercoastal Formation.

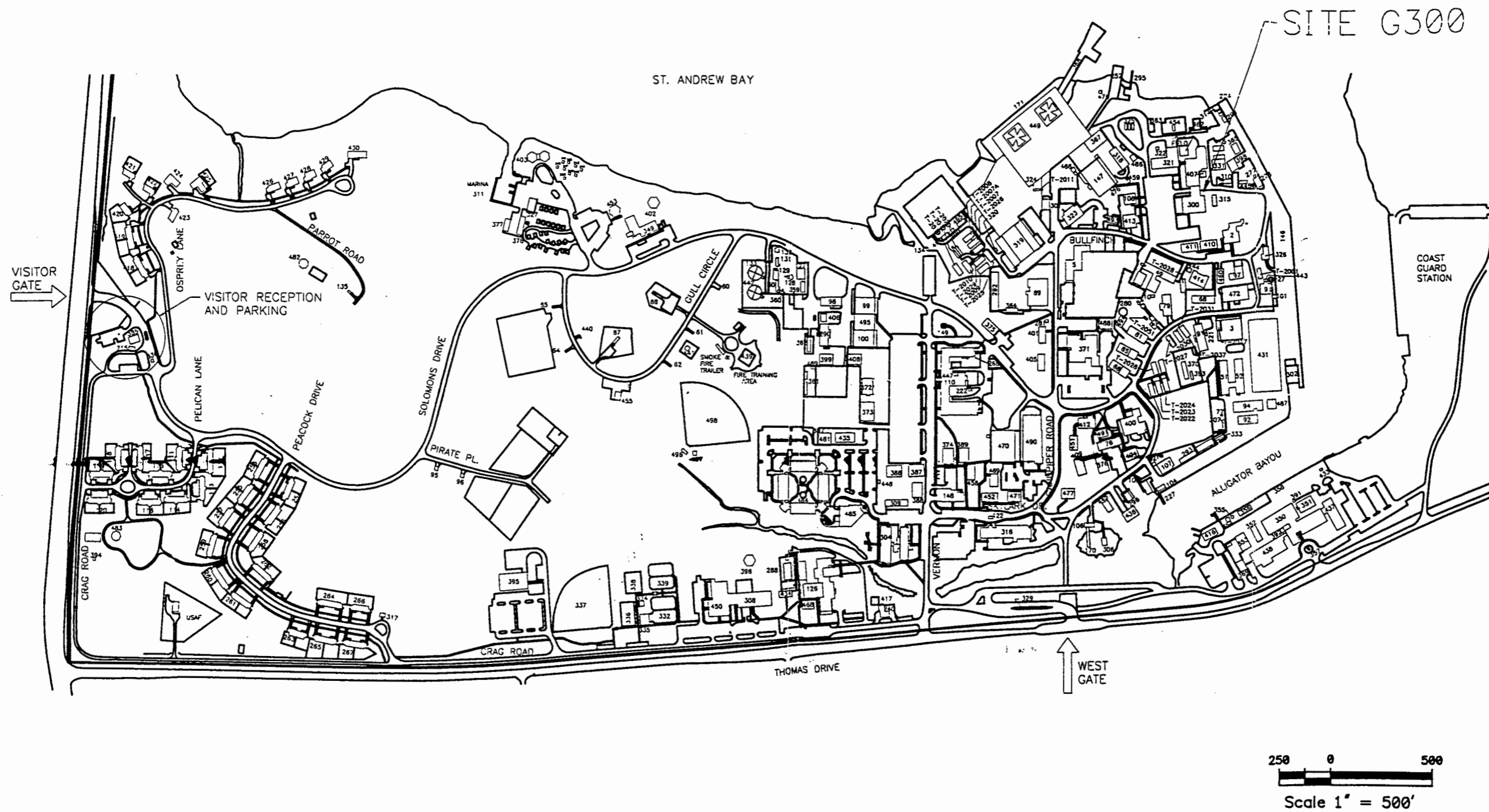
1.2.4 Land Use

Building 300 is located in the southeast area of the CSS property as shown on Figure 1-3. This area of the base is comprised of research facilities and various support activities for the Naval Experimental Dive Unit. No regulated underground storage tank systems are located at facilities adjacent to Building 300 (E.E. Jordan Company, Release Detection Program For Underground Storage Tanks, May, 1990).

1.2.5 Site Description

Site G300 contained one 2,500-gallon steel UST which stored diesel fuel. The UST supplied diesel fuel for an emergency generator located inside Building 300. The generator is located in the southwest corner of Building 300. A 150-gallon above ground day tank for the emergency generator is located inside the building. Fuel was pumped from the UST to the day tank as needed. A vent stack for the day tank extends outside the building. The vent pipe for the former UST was located immediately adjacent to the day tank vent. The UST was in service from approximately 1970 through 1996. The UST and product lines were removed on September 17, 1996, and an above ground tank was installed to store fuel for the emergency generator. The UST product line was cut, capped, and abandoned in place, where the line entered beneath structures. A site plan is shown as Figure 1-4.

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MODIFIED RCRA FACILITY INVESTIGATION REPORT

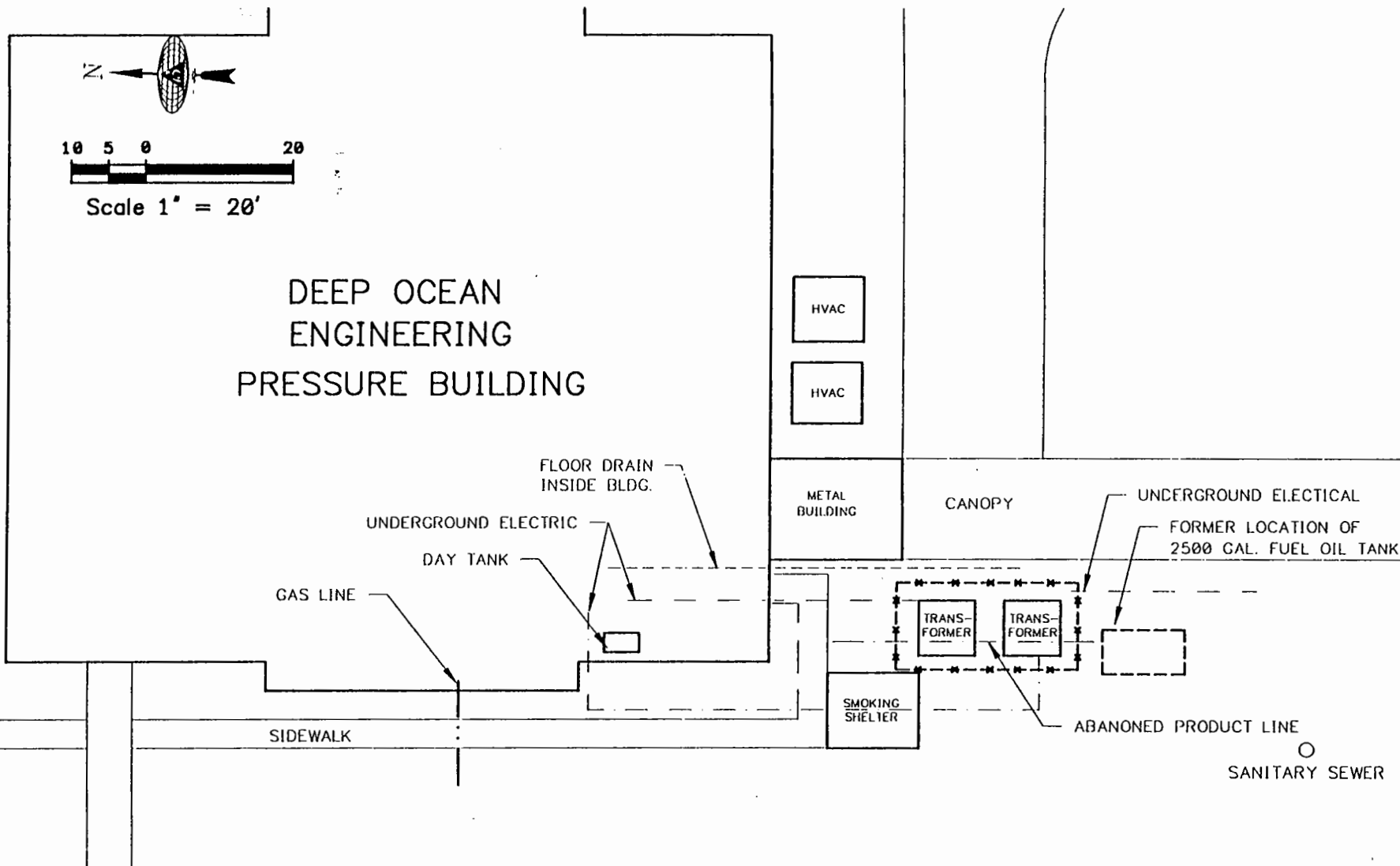
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FIGURE 1-3
BASE SITE LOCATION MAP
SITE G300

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



STORM SEWER

SITE MANAGER: PEC	CHECKED BY: RCM
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FIGURE 1-4

SITE PLAN
SITE G300

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

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1.2.6 Potable Water Well Survey

The potable water supply information presented in this report was obtained from RFI completed for CSS (ABB Environmental Services Inc., 1995). According to this report, potable water for most of Panama City and Panama City Beach, including CSS, is supplied by surface water. Panama City Beach also uses groundwater from the Floridan aquifer system, as do private and domestic water systems throughout Bay County.

The CSS is provided potable water from the Bay County Water System, operated by the Bay County Public Utilities Department. The system draws surface water from Deer Point Lake, located 7 miles northeast of CSS. The utilization of county water in urban areas such as Panama City, has been reported at 83 to 95 percent.

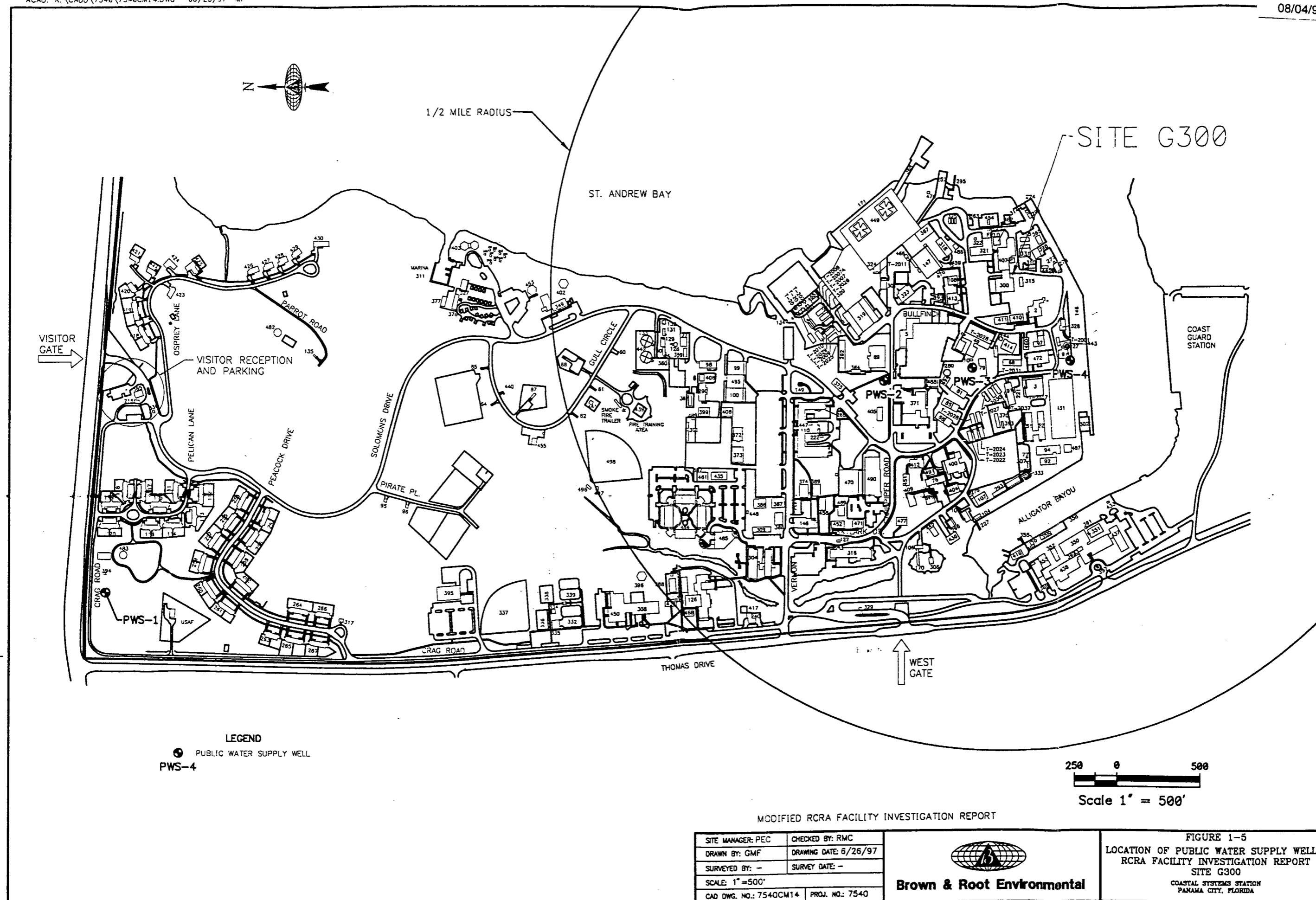
Panama City Beach operates a public water system which uses a combination of groundwater withdrawal and surface water. The groundwater is obtained from 13 wells located in western Bay County and surface water is purchased from the county water system.

The RFI indicates that records from the Northwest Florida Water Management District list 42 permitted wells screened in the surficial aquifer system in the vicinity of CSS. These 42 wells are classified as "domestic" or other "public supply". The permitted wells are 2-inch and 4-inch-diameter wells with yields of generally less than 20 gallons per minute.

Four public water supply wells are located at CSS. The location of the wells are provided on Figure 1-5. These wells have 12-inch diameter casings and are completed at depths of 350 to 400 feet bls. Of the four wells, only PWS-1, located near the housing area at Building 394, adjacent to highway 98, is currently in use. It is used to provide water for air conditioning and heat pumps only and draws water from the Floridan aquifer system at approximately 400 feet bls. The remaining wells are inactive.

No private potable wells or public potable supply wells were identified in the RFI Report as being within a 1/4-mile and 1/2-mile radius of the site, respectively.

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1.3 SITE HISTORY AND OPERATIONS

1.3.1 Site History

CSS is one of seven major research, test, and evaluation laboratories of the Space and Naval Warfare Systems Command. The site was first established in 1942 as a harbor for World War II convoy ships and as a liaison with a nearby shipyard. It later became an amphibious landing craft operations school. Research and development began in 1945 when the facility was renamed the US Navy Research Countermeasures Station. In 1952 a research and development program for the use of helicopters for mine countermeasures operations was implemented at the Base. The facility was redesignated as the Naval Coastal Systems Center in 1978 and again as Coastal Systems Station (CSS) in January 1992 (ABB Environmental Services, Inc. 1995).

The Navy Experimental Diving Unit Ocean Simulation Facility is located at Building 300. On September 7, 1996, the day tank used to store diesel fuel for an emergency generator located in the building, was overfilled during refueling of the day tank. The day tank, which has a float level and is equipped with a piping system which returns excess fuel to the source tank, could not accommodate the seven gallon per minute delivery rate of the emergency generator fuel pump, which was operated in the manual mode during the refueling of the tank. As a result, fuel was displaced into the day tank vent pipe, which extends outside Building 300, at the southwest corner of the building, approximately 10 feet above the top of the day tank. Eventually, fuel reached the end of the vent pipe, spilling to the ground at the southwest corner of Building 300 (Commanding Officer, Navy Experimental Diving Unit, 1996).

During the refueling of the tank, the pump was left unattended. Approximately one hour after the pump had been left unattended, a diesel fuel spill was discovered on the floor beneath the day tank and the pump was deactivated. Less than two quarts of diesel fuel had spilled on the floor and the spill was immediately cleaned up with absorbent pads. At the time, personnel were not aware a spill had occurred outside of Building 300. The spill outside the building was discovered on September 16, 1996, by a Florida State inspector who was at the site to inspect an unused underground storage tank which was being removed and noticed the smell at the site of the spill (Commanding Officer, Navy Experimental Diving Unit, 1996).

The Navy estimates approximately 132 gallons were spilled during the refueling of the day tank on September 7, 1996. This estimate is based on review of inventory records and fuel consumption rates for the outside diesel fuel tank from March 28, 1996 (Commanding Officer, Navy Experimental diving Unit, 1996).

1.3.2 Structural Integrity of Tanks and Lines

The UST G300 was unregulated, therefore no structural integrity testing of the tank and lines was performed on the diesel UST system. At the time the UST was removed in September 1996, the tank was observed to be in good condition. The structural integrity of the UST is described in the Tank Closure Assessment Report provided as Appendix C.

1.3.3 Initial Remedial Action

On September 20, 1996, Southern Earth Science Company of Panama City, Florida installed 17 soil borings to assess soil quality at the UST system tank field along the product line, and near the southwest corner of Building 300. Samples were collected from each of the borings for field screening with an organic vapor analyzer (OVA). The results of the field screening indicated "excessively contaminated soil," as defined by Chapter 62-770, FAC, at the southwest corner of Building 300. The soil contaminant plume was approximately 4 feet wide by 25 feet long and extended along the southwest corner of the building, sidewalk, and possibly under the building. In September 1997, an Initial Remedial Action (IRA) was performed to remove "excessively contaminated soil". During the IRA, soil excavation was halted after it became apparent the amount of "excessively contaminated soil" observed during the excavation, may have resulted from various generator day tank overfills. Figures showing the location of the soil borings and tables summarizing soil OVA sample intervals and vapor concentrations are included in the Fuel Spill Investigation Summary document provided in Appendix D.

1.3.4 Previous Investigations

During removal of the UST system, the US Navy Public Works Center (PWC) collected seven soil samples for hydrocarbon vapor screening using an organic vapor analyzer (OVA). The soil samples were collected at depths of 2 feet, 4 feet, and 8 feet bls from within the tank excavation. Soil vapor screening samples were collected from each side and the bottom of the tank excavation. Results of the soil screening identified no soil hydrocarbon vapors in soil samples collected from the vadose zone. The soil vapor sample locations and the depth of sample collection with corresponding OVA readings, are provided in Appendix C.

A temporary monitoring well was placed at the center of the UST excavation and groundwater samples were collected on March 25, 1997. Groundwater samples collected from the temporary monitoring well were analyzed using US Environmental Protection Agency (USEPA) Methods SW-846, 8260 and 8270. Results of the sampling reported no petroleum constituents above state target levels for storage tank

closure. Groundwater concentrations of chloroform, bromodichloromethane, and dibromochloromethane were reported at levels below the State of Florida Drinking Water Standards. The Storage Tank Closure Assessment Form is included in Appendix C.

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2.0 SUBSURFACE INVESTIGATION METHODS

2.1 QUALITY ASSURANCE

The site investigation was conducted in accordance with the Standard Operating Procedures prescribed by the FDEP Quality Assurance Section Document DER-001/92, and adopted by the B&R Environmental Comprehensive Quality Assurance Plan (CQAP) Number 870055G.

2.2 SOIL BORING PROCEDURES

2.2.1 Direct-Push Soil Borings

A soil hydrocarbon vapor assessment was conducted at the site by B&R Environmental on March 17 through March 21, 1997. Fifteen soil borings (SB-1 through SB-15) were advanced in the immediate area surrounding the former diesel UST system. Soil samples were collected from each boring for the purpose of organic vapor screening and for lithologic description. Soil borings were advanced using a Stratoprobe, truck mounted, direct-push, hydraulic soil probe. Soil samples were collected using two-foot long stainless steel split barrel samplers lined with plastic sleeves. Soil samples were collected at five foot intervals from the ground surface until the water table was encountered. At soil boring locations, SB-1, SB-2, SB-7, and SB-15, soil samples were collected continuously from the ground surface until the water table was encountered. Wet soils were present at depths ranging from approximately 8 to 9 feet bls. Soil boring locations and boring completion depths are summarized on Figure 2-1 and Table 2-1, respectively. Soil boring logs are provided in Appendix E.

Prior to the advancement of the soil probe at each boring location, the probe was decontaminated according to B&R Environmental's CQAP. Soil samples were visually inspected for evidence of oil staining. Soil vapor analysis was conducted on each soil sample collected from the vadose zone using an Organic Vapor Analyzer-Flame Ionization Detector (OVA-FID). Soil vapor analysis was performed in accordance with the headspace method prescribed by Chapter 62-770.200(2) FAC. This method of headspace screening is presented in detail in Appendix F. Headspace concentrations from soil vapor analysis are summarized in Table 2-1.

On April 23, 1997, B&R Environmental advanced three soil borings using a stainless steel, 3-inch, inside diameter (ID) hand-auger. The borings were advanced at locations SB01, SB04, and SB05 to collect soil samples for laboratory analysis to confirm the presence of petroleum-related compounds in the vadose zone soils. Sample locations and the depth of sample collection were based on the headspace readings obtained during the soil vapor analysis conducted during March 1997. Samples were collected at each boring location at a depth of 6 to 7 feet bls. Prior to advancing the hand-auger at each boring location, the hand-auger was decontaminated according to B&R Environmental's CQAP.

Decontamination of sampling equipment generated rinse water which was containerized in 55-gallon drums and will be removed for proper disposal by a Florida-licensed waste hauler.

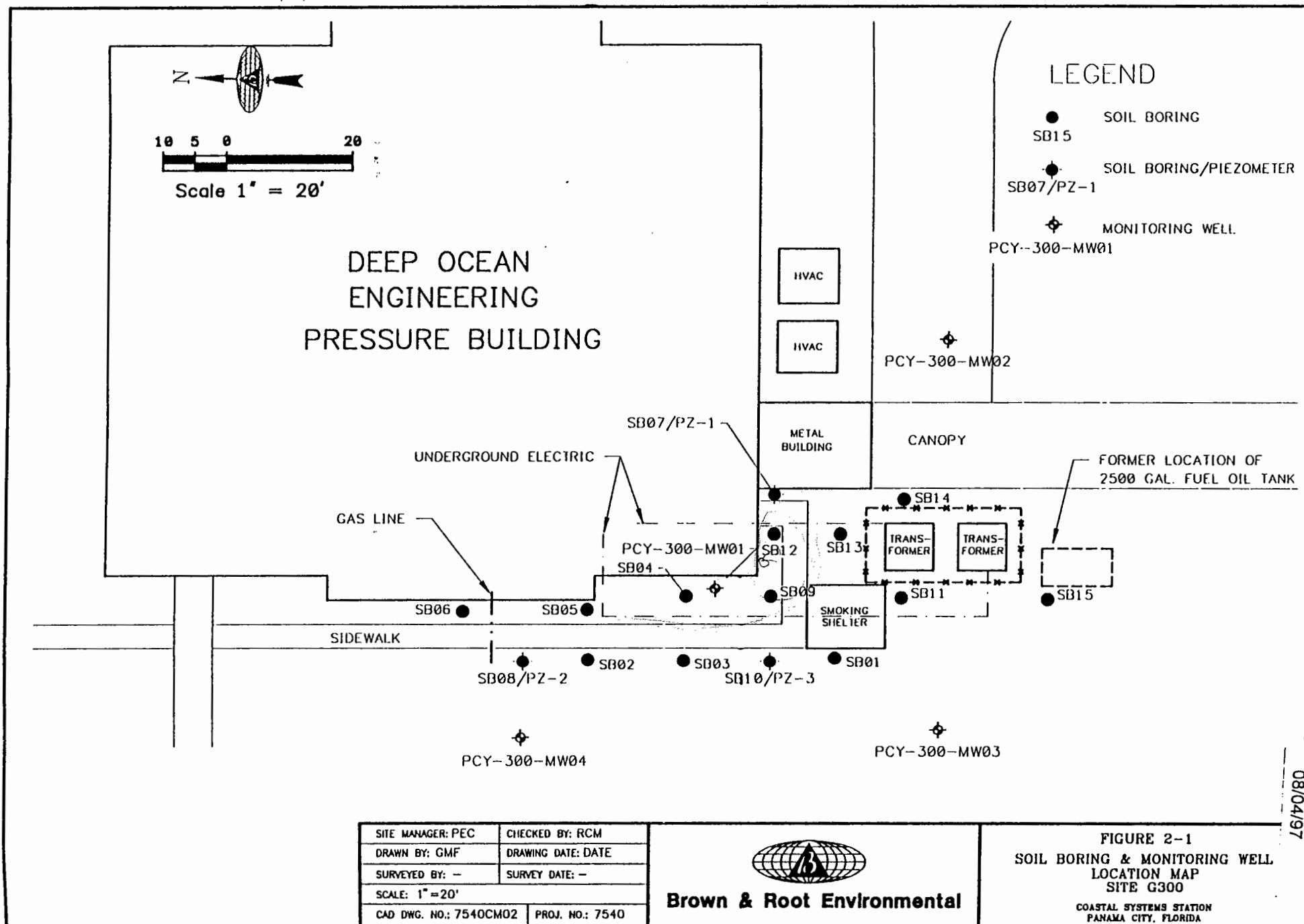
2.2.2 Drilling and Soil Sampling Methods

On April 22, 1997, four borings, PCY-300-MW01, PCY-300-MW02, PCY-300-MW03, and PCY-300-MW04, were drilled by Gulf Atlantic Drilling under the supervision of a B&R Environmental geologist. These borings were advanced for the installation of groundwater monitoring wells. Soil grab samples collected during borehole advancement were used to characterize the site lithology and/or provide additional assessment data on soil vapor concentrations in the area. The location of the monitoring wells are shown on Figure 2-1. Soil boring logs are included in Appendix E.

Underground utilities were investigated at each boring location by advancing the soil boring with a post hole digger from 0 to 4 feet bls. The borings were continued with a truck-mounted drill rig, using 4 1/4-inch ID hollow-stem augers. Prior to the collection of the soil samples and well installations, the auger flights were decontaminated according to B&R Environmental's CQAP.

Soil vapor analysis was performed on soil grab samples in accordance with the headspace prescribed in Chapter 62-770.200(2) FAC. This method of headspace screening is presented in detail in Appendix F. Hydrocarbon vapor concentrations from soil vapor analysis are summarized in Table 2-1.

Soil cuttings generated during the well installations were placed in a 55-gallon steel drums. A composite soil sample was collected from the drums and analyzed by USEPA Methods SW-846 8010 (volatile organic hydrocarbons), 8020 (volatile organic aromatics), 8100/FLPRO (polynuclear aromatic hydrocarbons and total recoverable petroleum hydrocarbons), total halides, and eight



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TABLE 2-1

**SOIL VAPOR MEASUREMENTS
COASTAL SYSTEMS STATION
SITE G300
PANAMA CITY, FLORIDA
FDEP FACILITY NO. 038518667
PAGE 1 OF 2**

Soil Boring No.	Date of Measurement	Sample Interval (feet bls)	Headspace Readings (ppm)		
			Total Organic Reading	Carbon Filtered Reading	Net Reading
SB01	03-18-97	1	ND	-	ND
		2	ND	-	ND
		4	ND	-	ND
		6	ND	-	ND
		8	ND	-	ND
SB02	03-18-97	1	ND	-	ND
		2	ND	-	ND
		4	ND	-	ND
		6	ND	-	ND
		8	ND	-	ND
SB03	03-18-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	ND	-	ND
		6-7	ND	-	ND
SB04	03-18-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	300	ND	300
		6-7	100	ND	100
SB05	03-18-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	110	ND	110
		6-7	50	ND	50
SB06	03-19-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	ND	-	ND
		6-7	ND	-	ND
SB07	03-19-97	0-1	ND	-	ND
		1-2	ND	-	ND
		2-3	ND	-	ND
		3-4	ND	-	ND
		5-6	2	ND	2
		6-7	ND	-	ND
SB08	03-19-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	ND	-	ND
		6-7	ND	-	ND
SB09	03-19-97	5-6	40	ND	40
		6-7	100	ND	100

TABLE 2-1

**SOIL VAPOR MEASUREMENTS
COASTAL SYSTEMS STATION
SITE G300
PANAMA CITY, FLORIDA
FDEP FACILITY NO. 038518667
PAGE 2 OF 2**

SB10	03-19-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	ND	-	ND
		6-7	ND	-	ND
SB11	03-20-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	ND	-	ND
		6-7	ND	-	ND
SB12	03-20-97	5-6	ND	-	ND
		6-7	ND	-	ND
SB13	03-20-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	ND	-	ND
		6-7	ND	-	ND
		7-8	ND	-	ND
SB14	03-20-97	0-1	ND	-	ND
		1-2	ND	-	ND
		5-6	ND	-	ND
		6-7	ND	-	ND
SB15	03-20-97	0-1	ND	-	ND
		1-2	ND	-	ND
		3-4	ND	-	ND
		5-6	ND	-	ND
		7-8	ND	-	ND
PCY-300-MW02	04-22-97	2-3	ND	-	ND
		4-5	ND	-	ND
		6-7	ND	-	ND

Note

- = not analyzed

bls = below land surface

ppm = part per million equivalent methane

Wet soils encountered at approximately 6 to 7 feet bls.

RCRA metals. The soil will be removed for proper disposal by a Florida-licensed waste hauler. Pre-burn soil laboratory data sheets are included in Appendix G.

2.3 WELL CONSTRUCTION

2.3.1 Piezometer Construction

Piezometer wells were installed in conjunction with the soil boring procedures discussed above in Section 2.2.1. Soil borings SB-7, SB-8 and SB-10 were converted into piezometers PZ-1, PZ-2 and PZ-3, respectively. The piezometers were used to obtain water level measurements to determine relative groundwater elevations and flow direction. The piezometers were constructed of 1.25-inch ID, flush-threaded, schedule 40 PVC riser from 0 to 4 feet bls with 0.010-inch slotted screen interval from 4 to 14 feet bls. Native aquifer material was used as the filter media from 3 to 14 feet bls. A 1-foot layer of bentonite pellets was placed above the natural sand pack and hydrated. The remainder of the annulus was grouted to within 3-inches of the top of casing with a Type I Portland Cement/Bentonite slurry. The piezometers were secured with a locking water tight cap within an 8-inch diameter steel manhole. Well completion logs are provided in Appendix H.

2.3.2 Monitoring Well Construction

Monitoring wells were installed in conjunction with the soil boring procedures discussed above in Section 2.2.2. The wells were screened to intersect the water table. Monitoring well placements were selected to provide spatial coverage around the former diesel UST for groundwater sampling. Results of the sampling were used to evaluate if a dissolved hydrocarbon plume exists in the area of the former diesel UST system.

The monitoring wells were installed using a RAM 10 Deep Rock drill rig. Wells PCY-300-MW01, PCY-300-MW02, PCY-300-MW03, and PCY-300-MW04 were advanced using 4 1/4-inch ID hollow-stem augers. Each well was constructed of 2-inch ID, threaded, schedule 40 PVC solid riser and 0.010-inch slot well screen with silt trap and well bottom cap. Each well was installed to approximately 15 feet bls and was completed with a 10 foot screen section. Each annulus was filled to approximately 2 feet above the well screen with US Standard Sieve size 20/30 silica sand. A 6-inch layer of bentonite pellets was placed above the sand pack and hydrated. The remainder of the annulus was grouted to the surface. Each well is secured with a locking, water-tight cap

within a steel, 8-inch diameter steel manhole. The manhole was set within a 24-inch square concrete apron finished slightly above grade. Well completion logs are provided in Appendix H.

Each well was developed using a centrifugal pump. During well development, field measurements of pH, temperature, and specific conductance were monitored from the purge water generated. The wells were developed up to a maximum of one hour or until the field measurements became stable and the purge water clear. Water quality stabilization was determined using the following criteria: temperature $\pm 0.5^{\circ}\text{C}$, pH ± 0.1 unit, and specific conductance ± 10 umhos/cm. The wells were developed under the supervision of a geologist. All development water was containerized for disposal.

2.4 LITHOLOGIC SAMPLING

Representative soil samples were collected during the soil vapor assessment to assess the shallow subsurface geologic conditions at the site. Samples used for lithologic description were collected from a stainless steel split spoon sampler lined with plastic sleeves. Grab samples from soil cuttings generated during monitoring well installations were also used for lithologic description. Soil boring logs are included as Appendix E.

2.5 SOIL VAPOR ANALYSIS

Headspace analysis was conducted on soil samples collected during the soil vapor assessment (direct push borings and monitor well installation borings) using an OVA-FID. The soil vapor analysis was performed according to the headspace method prescribed in Rule 62-770.200 (2) FAC. Screened soil samples with corrected headspace levels in excess of 50 ppm are defined as "excessively contaminated soil" at diesel contaminated sites. The Headspace Methodology for Determining Soil Organic Vapor Concentrations is described in detail in Appendix F.

2.6 SOIL SAMPLING

Upon completion of each soil boring during the direct-push sampling investigation, a soil sample was retained from the sample interval which exhibited the highest OVA reading. The sample was placed in a 4-ounce glass jar and immediately provided to TEG for screening of TPH-DRO, by USEPA Modified Method SW-846 3550/8015. TEG provided an on-site mobile laboratory for screening purposes. Data reports for the field screening of TPH-DRO are included in Appendix I.

Soil samples for laboratory analysis were collected at SB01, SB04, and SB05 and analyzed by USEPA Methods 8010 (volatile organic halocarbons), 8020 (volatile organic aromatics), and 8100 (polynuclear aromatic hydrocarbons). Samples were also analyzed for total recoverable petroleum hydrocarbon (TRPH) by the FLPRO analytical method, and for lead by SW-846 7421. These samples were collected to confirm the presence of petroleum-related compounds. The laboratory data reports are included in Appendix J.

2.7 HYDROLOGIC INVESTIGATION

2.7.1 Water Level Measurements

The depths to groundwater in monitoring wells PCY-300-MW01, PCY-300-MW02, PCY-300-MW03, PCY-300-MW04, and piezometer wells PZ-1, PZ-2 and PZ-3 were collected on April 23, 1997. Measurements were collected from the north rim of the top of well casings using an electronic water level indicator. The water level measurements were collected to determine the depth to water in the surficial aquifer. The water level measurement field forms are provided in Appendix K.

The elevation of the north rim for each top of well casing was surveyed by B&R Environmental to the nearest 0.01 foot relative to an on-site datum. An arbitrary benchmark was established using the top of well casing for PZ-2. A relative elevation of 10.00 feet was assigned to the bench mark. An auto-level transit and surveying rod were used to survey the casing elevations. The relative elevation was calculated by subtracting the depth to water from the top of casing elevation.

2.7.2 Aquifer Characteristics

On April 2, 1997, B&R Environmental performed aquifer slug tests on monitoring wells PCY-300-MW02, PCY-300-MW03, and PCY-300-MW04. Each test was performed by displacing a volume of water with a "slug" and recording the recharge rate of the displaced water in the well. The recharge rate was recorded using an electronic data logger and pressure transducer. The Bouwer and Rice methodology for partially penetrating wells in unconfined aquifers was utilized to calculate hydraulic conductivity values for the three monitoring wells as described in Bouwer, 1989 and Bouwer and Rice, 1976. Calculations were performed using the Aqtesolv™ aquifer characterization program as described in Duffield and Rumbaugh, 1991. Slug test data and calculations used to determine hydraulic conductivity are included in Appendix L.

2.7.3 Groundwater Flow Velocity and Transmissivity

The horizontal groundwater gradient across the site was evaluated from water level measurements collected on April 23, 1997. The groundwater gradient was calculated by determining the perpendicular distance between groundwater contours developed from groundwater elevation data. Groundwater gradient calculations are included in Appendix M.

The groundwater flow gradient was determined using the following equation:

$$i = \frac{h_1 - h_2}{d}$$

where:

- i = the hydraulic gradient
- h_1 = the water elevation at point 1
- h_2 = the water elevation at point 2
- d = the distance between point 1 and point 2

Potential movement of groundwater at the site may be described in terms of transportation by natural flow in the saturated zone while assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \left(\frac{K}{n} \right) \times i$$

where:

- V = average seepage velocity
- K = hydraulic conductivity
- n = effective porosity (assumed)
- i = average hydraulic gradient

Site specific transmissivity is calculated using the following equation:

$$T = Kb_e$$

where:

T = transmissivity

K = hydraulic conductivity

b_e = affected aquifer thickness

The groundwater seepage velocity and aquifer transmissivity calculations are included in Appendix M.

2.7.4 Tidal Influence Survey

A tidal survey was conducted during the RFI to determine if the potentiometric surface at locations close to Alligator Bayou are influenced by tidal fluctuations. Continuous water level measurements were obtained from several selected monitoring wells for a period of 24 hours. Monitoring wells PCY-14-5 and PCY-1-3 were selected at SWMU 1 and Area of Concern (AOC) 2, to evaluate the effects of tidal influence near Alligator Bayou. Monitoring well PCY-14-5 is located 40 feet from the seawall at Alligator Bayou and was paired with PCY-1-3, located 200 feet from the Bayou.

2.8 WATER SAMPLING

2.8.1 Free Product Sampling

Prior to groundwater sampling on April 23, 1997, B&R Environmental personnel checked each well for free product using a clean disposable bailer. The bailer was used to extract a water sample from the top of the well's water column to visually inspect for free product. Free product was not encountered during the CA by B&R Environmental personnel.

2.8.2 Groundwater Sampling Direct-Push Investigation

During the direct-push field investigation, each soil boring was continued into the saturated zone to collect groundwater samples for mobile laboratory screening. The samples were collected using a detachable drive tip attached to a 24-inch long, retractable, stainless steel well screen encased in the lead probe tube. After the water sampler was advanced into the water bearing zone, the probe was withdrawn 24 inches to allow the retractable screen to open to the formation.

For groundwater recovery a length of Tygon tubing was inserted into the probe and connected to a peristaltic pump. Several screen volumes were then pumped from the probe in order to reduce the turbidity level. After sufficient purging, groundwater samples were collected by pumping directly into 40 ml vials. The samples were immediately taken to the on-site mobile laboratory for screening for TPH-DRO constituents. All purge water was placed in 55-gallon drums on-site for later characterization and disposal. The results of the mobile laboratory screening are presented in Appendix I.

2.8.3 Groundwater Sampling of Monitoring Wells

Groundwater sampling of monitoring wells was performed to determine the presence or absence of dissolved petroleum hydrocarbons in groundwater in the vicinity of the diesel UST system. Groundwater samples were collected by B&R Environmental personnel from well PCY-300-MW01, PCY-300-MW02, PCY-300-MW03, and PCY-300-MW04 on April 23, 1997. Groundwater samples collected from each monitoring well were analyzed using USEPA Method 239.2 for lead (unfiltered), USEPA Method 504.1 for gas chromatograph (GC) extractable volatile organics (1,2-dibromoethane or EDB), USEPA Method 601 for GC purgeable halocarbons, and USEPA Method 602 for GC purgeable aromatics (benzene, toluene, ethylbenzene, xylenes, and methyl-tert butyl ether), USEPA Method 8100 for GC PAHs, and Florida PRO for TRPH. The groundwater samples were collected using new tygon tubing and a peristaltic pump. Approximately five well volumes of groundwater were removed from each well using the peristaltic pump and tygon tubing. Temperature, pH, specific conductance measurements, and well purge volumes were recorded at the time of sample collection and are provided in Appendix K. Groundwater samples were placed on ice and shipped to Accutest Laboratories, Inc., in Orlando, Florida.

All sampling activities were performed in accordance with the procedures prescribed in the FDEP Quality Assurance Section's Standard Operating Procedures for Laboratory Operations and Sample Collection Activities, (DER-001/92), adopted by B&R Environmental's CQAP. In accordance with DER-001/92 section 4.4.2, sample preservation was accomplished by obtaining pre-preserved containers from a laboratory with a DER approved CQAP (Accutest Laboratories, Inc.). During the sampling events, quality control samples (e.g. equipment blanks) were prepared and submitted to the laboratory as required by the approved CQAP. Sampling activities were documented in a site-specific field logbook, and samples were transmitted under chain-of-custody protocols to the laboratory. Groundwater laboratory data sheets are included in Appendix N.

3.0 RESULTS OF INVESTIGATION

3.1 SITE HYDROGEOLOGY

3.1.1 Lithology

The site is underlain by sediments composed predominately of light gray to white to yellowish orange, fine grained sand, with little to no fines. This soil type extends to at least 15 feet bls, which was the maximum depth drilled during the contamination assessment investigation. Due to the homogeneity of the subsurface, no lithologic cross-section was constructed. Soil boring logs are included as Appendix E.

3.1.2 Aquifer Characteristics and Classification

Based on water level data collected from site monitoring wells on April 23, 1997, the depth to the shallow aquifer across the study area is approximately 7 to 9 feet bls. The groundwater level measurements are presented in Table 3-1. The water level measurement field forms are provided in Appendix K. The aquifer is classified as a G-II aquifer based on dissolved solids content typically associated with the surficial aquifer in the area of CSS.

Rising-head slug tests conducted at wells PCY-300-MW02, PCY-300-MW03, and PCY-300-MW04 were used to estimate the hydraulic conductivity of the surficial aquifer at Building 300. The geometric mean hydraulic conductivity for the surficial aquifer was estimated 10.24 ft/day as shown by the hydraulic conductivity calculations provided in Appendix L.

Using the groundwater flow gradient equation presented in Section 2.8.3, a hydraulic gradient of 0.01 feet/foot to the south-southeast was calculated from the data collected on April 23, 1997. The groundwater flow direction is depicted in Figure 3-1.

Lithologic data and available literature indicate the effective porosity of the soils comprising the surficial aquifer is approximately 0.30 (Heath, 1994).

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**TABLE 3-1
DEPTH TO GROUNDWATER MEASUREMENTS
Site G300
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667**

Monitoring Well ID	Date Collected	Top of Well Casing Elevation (feet AD)	Free Product Thickness (feet)	Depth to Water (feet below TOC)	Water Table Elevation (feet AD)	Well Screen Interval (feet bls)
PCY-300-MW01	04/23/97	10.28	0.00	8.83	1.45	5 to 15
	04/24/97		0.00	8.85	1.43	
PCY-300-MW02	04/23/97	10.00	0.00	8.79	1.21	5 to 15
	04/24/97		0.00	8.83	1.17	
PCY-300-MW03	04/23/97	10.30	0.00	8.94	1.36	5 to 15
	04/24/97		0.00	8.94	1.36	
PCY-300-MW04	04/23/97	8.91	0.00	7.28	1.63	5 to 15
	04/24/97		0.00	7.29	1.62	
PZ-1	03/21/97	10.44	0.00	8.73	1.71	4 to 14
	4/23/97		0.00	9.13	1.31	
PZ-2	03/21/97	10.00	0.00	8.37	1.63	4 to 14
	4/23/97		0.00	8.38	1.62	
PZ-3	03/21/97	10.17	0.00	8.64	1.53	4 to 14
	4/23/97		0.00	8.75	1.42	

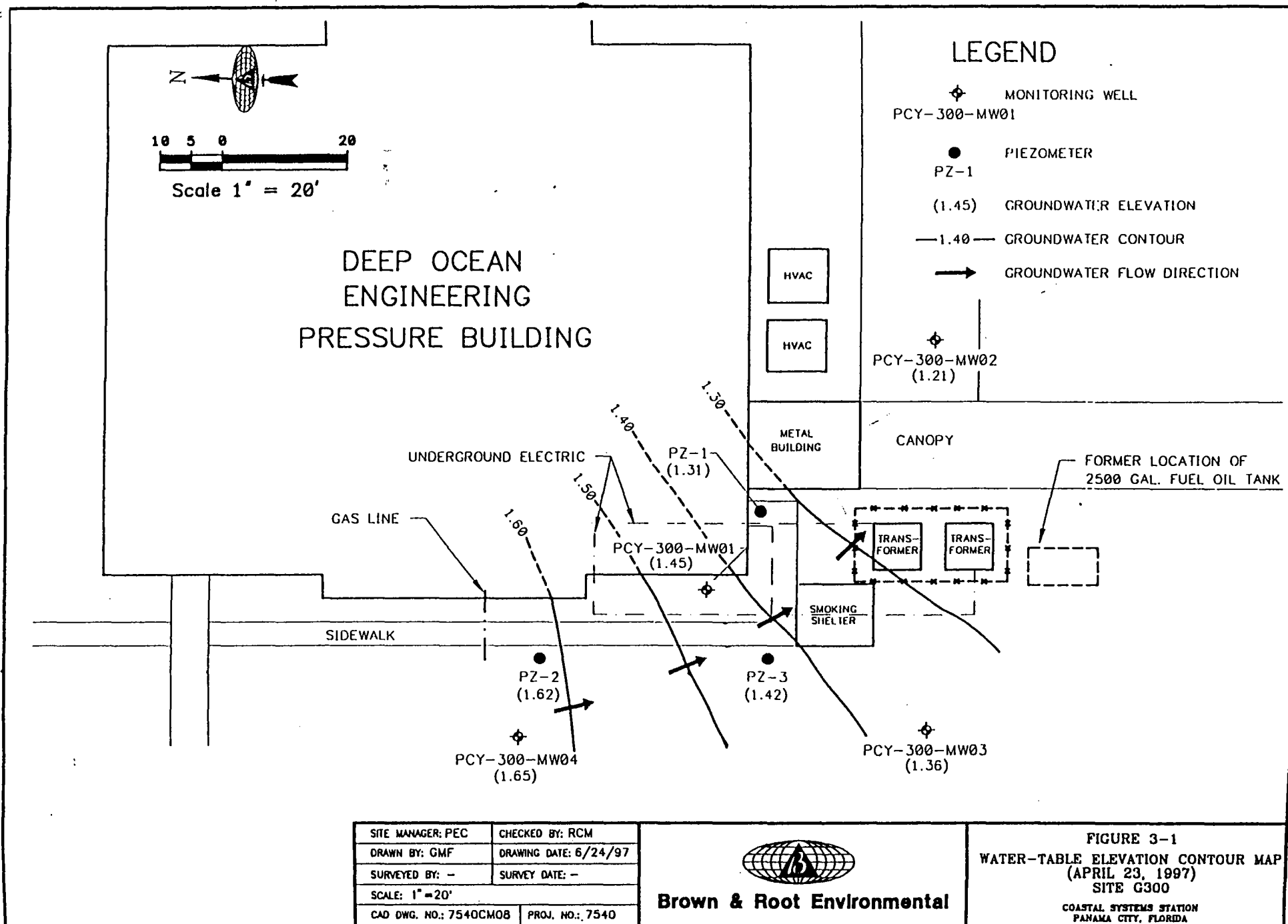
Note

bls = below land surface

ID = identification

AD = arbitrary datum elevation (relative to the top of well casing for piezometer well PZ-2)

TOC = top of well casing



Using a hydraulic conductivity of 10.24 feet/day, the hydraulic gradient of 0.01 feet/foot, an inferred effective porosity value of 0.30, and Darcy's Equation as stated in Section 2.8.3, the groundwater seepage velocity across the site was calculated at 0.34 feet/day in a south-southeast direction. The transmissivity of the surficial aquifer was calculated at 4.9×10^{-2} ft²/day. Groundwater gradient and transmissivity calculations are included in Appendix M.

3.1.3 Tidal Influence

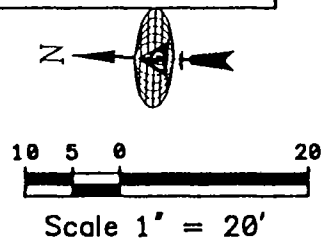
Results of the tidal survey conducted previously at monitoring wells PCY-14-5 and PCY-1-3 indicate that at SWMU 1 and AOC 2, the distance in which significant tidal influence was observed, was less than 40 feet from Alligator Bayou, and less than 200 feet from the shoreline at St. Andrew Bay. The presence of a sea wall at the bayou may interfere with natural groundwater flow and impede tidal influence in the area near the bayou (ABB Environmental Services Inc., 1995). Building 300 is located approximately 500 feet east of SWMU 1 and AOC 2, 350 feet north of Alligator Bayou, and 400 feet west of St. Andrew Bay. Therefore, significant tidal influence is not expected at Site G300.

3.2 SOIL QUALITY

The vertical and horizontal extent of petroleum impacted soil in the vadose zone was assessed through soil vapor analysis performed during the direct-push investigation and monitoring well installation as described in Section 2.2.1 and 2.2.2 of this report. The highest soil vapor concentrations detected in vadose zone soils were 300 parts per million (ppm), 110 ppm, and 100 ppm, at boring locations SB-4, SB-5 and SB-9 respectively. These samples were collected at depths of six to seven feet bls. These data indicate that "excessively contaminated" soil (greater than 50 ppm OVA response as defined by Chapter 62-770.200, FAC) are present in the vicinity of borings SB-4, SB-5, and SB-9. Soil vapor screening results are presented in Table 2-1. Soil boring locations and vapor readings are depicted on Figure 3-2.

Analysis of soil samples for field screening of TPH-DRO constituents using a mobile laboratory indicated that petroleum-related compounds were present in the vadose zone soil. TPH-DRO concentrations were detected in soil samples from borings SB-4, SB-5, SB-9 and SB-13. The TPH-DRO concentrations ranged from 22.1 milligrams per kilogram (mg/kg) in SB-13 to 7280 mg/kg in SB-4. TPH-DRO concentrations in soil samples from the remaining borings were below method detection limits. The mobile laboratory results indicate a similar distribution of contaminants as the OVA results. The TPH-DRO concentrations are shown on Figure 3-3.

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DEEP OCEAN ENGINEERING PRESSURE BUILDING

LEGEND

- SB15 SOIL BORING
- | |
|-----|
| 300 |
| 6 |

 OVA READING (PPM)
DEPTH OF SAMPLE (FT)
- ND NOT DETECTED

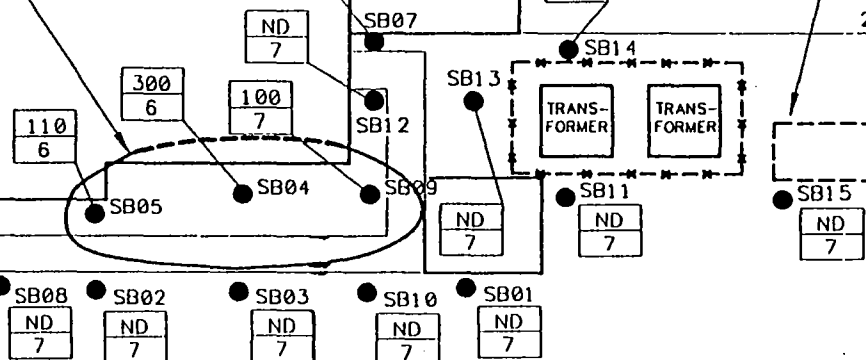
PCY-300-MW02 MONITORING WELL
PCY-300-MW02

50 ppm OVA (FID)

METAL
BUILDING

CANOPY
FORMER LOCATION OF
2500 GAL. FUEL OIL TANK

SIDEWALK



SITE MANAGER: PEC	CHECKED BY: RMC
DRAWN BY: GMF	DRAWING DATE: 6/24/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1"=20'	
CAD DWG. NO.: 7540CM01	PROJ. NO.: 7540



Brown & Root Environmental

FIGURE 3-2
SOIL VAPOR CONCENTRATION (FID) MAP
SITE G300

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

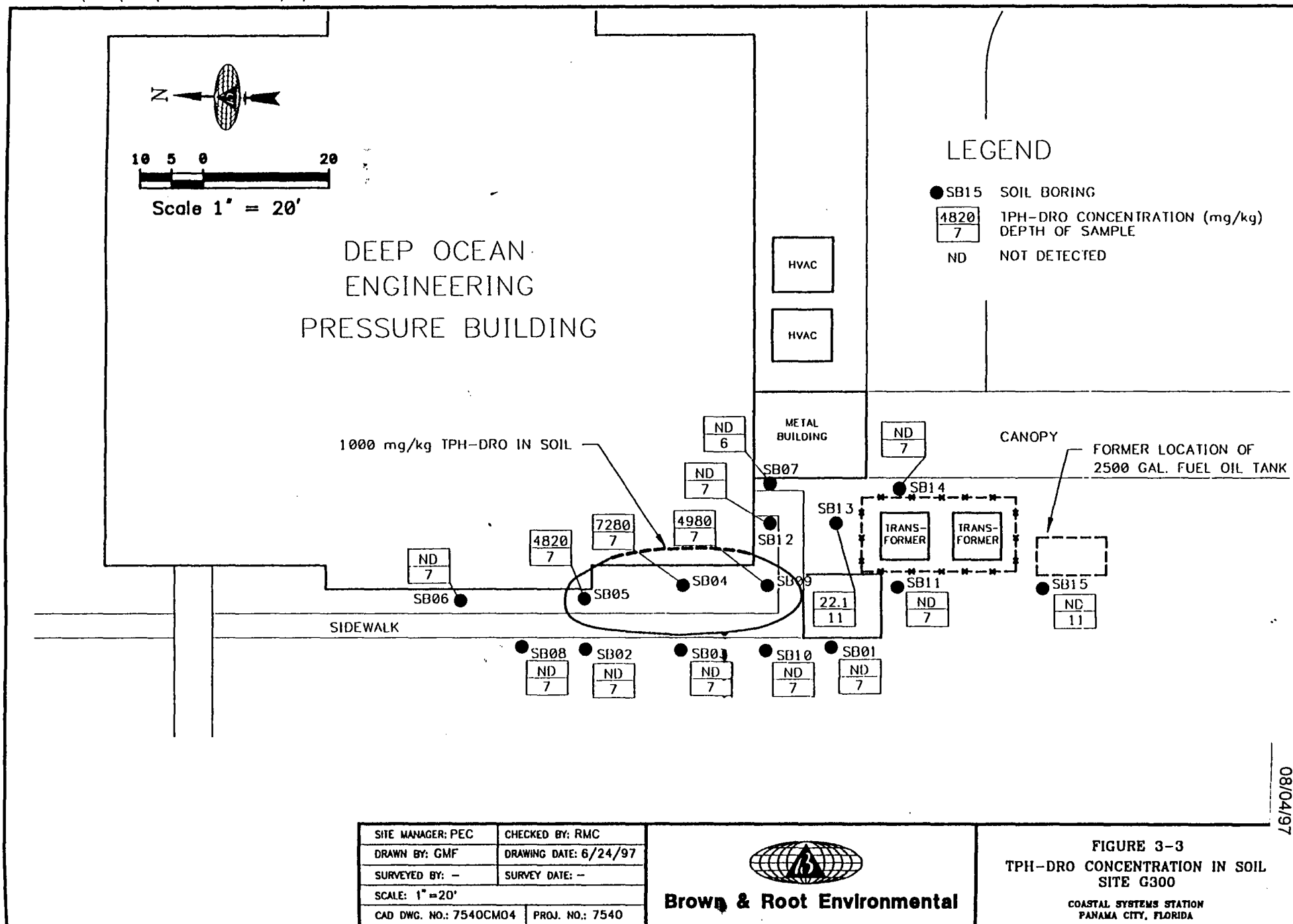
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3-7

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Soil samples collected for laboratory analysis at SB01, SB04, and SB05 identified petroleum compounds characteristic of diesel fuel in vadose zone soils adjacent to the southwest corner of Building 300. The highest concentrations of petroleum constituents were detected in soil samples SB04 and SB05. The soil sample at SB04 contained naphthalene, 1-methylnaphthalene and 2-methylnaphthalene at concentrations of 19,500 micrograms per kilogram (ug/kg), 55,600 ug/kg, and 63,300 ug/kg, respectively. TRPH concentrations were detected in samples at SB04 and SB05 at 5,390 mg/kg and 2,020 mg/kg respectively. Concentrations of ethylbenzene and xylene were reported in the samples from SB04 and SB05. The highest concentrations of ethylbenzene and xylene were detected in SB04 at 1,260 ug/kg and 4,320 ug/kg, respectively. Soil quality data is summarized on Table 3-2.

3.3 WATER QUALITY

Groundwater quality results from the mobile laboratory field screening reported TPH-DRO constituents in groundwater grab samples collected from soil boring locations SB-4, SB-9, SB-12, SB-12, SB-13 and SB-14. The TPH-DRO concentrations ranged from 875 µg/l in SB-13 to 17,400 µg/l in SB-9. TPH-DRO concentrations in groundwater samples from the remaining soil borings were below method detection limits. TPH-DRO concentrations in groundwater are presented in Figure 3-4.

Groundwater laboratory results from samples collected from monitoring wells on April 23, 1997 reported the following:

Concentrations of volatile organic aromatics (VOAs) were reported below laboratory detection limits in groundwater samples collected from PCY-300-MW03 and PCY-300-MW04. Benzene was detected at 8.2 ug/L and 1.8 ug/L in samples collected from PCY-300-MW01 and PCY-300-MW02, respectively. These concentrations are above the FDEP target level of 1 ug/L for benzene, established in Chapter 62-770, FAC. Total VOAs (the total sum of benzene, toluene, ethylbenzene, and xylenes) concentrations were detected in samples from wells PCY-300-MW01 and PCY-300-MW02, at concentrations of 26 ug/L and 1.8 ug/L, respectively. These concentrations are below the FDEP target level of 50 ug/L for total VOAs. Benzene and total VOA groundwater concentrations are provided on Figure 3-5.

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TABLE 3-2
SUMMARY OF SOIL QUALITY:
SELECTED PARAMETERS FROM THE KEROSENE
ANALYTICAL GROUP
Site G300
Coastal Systems Station, Panama City, Florida
FDEP ID No. 038518667

Sample Location	Date Sampled	Ethyl-benzene (µg/kg)	Xylenes (µg/kg)	TRPH (mg/kg)	DCE (µg/kg)	1-Methyl-naphthalene (µg/kg)	2-Methyl naphthalene (µg/kg)	Naphthalene (µg/kg)	Lead (mg/kg)
300-SB01-0607	04/23/97	<1.0	<3.0	11.0	<1.0	<340	<340	<340	26.6
300-SB04-0607	04/23/97	1260	4320	5390	<55	55600	63300	19500	2.2
300-SB05-0607	04/23/97	37.9	159	2020	<1.0	<7200	<7200	<7200	2.6
Equipment Blank	04/23/97	< 1.0 [^]	<3.0 [^]	< 0.50 ^{^^}	2.5 [^]	<10 [^]	<10 [^]	<10 [^]	<0.0030 ^{^^}
Trip Blank	04/17/97	< 1.0 [^]	<3.0 [^]	NA	2.2 [^]	NA	NA	NA	NA

DCE 1,2-Dichloroethane

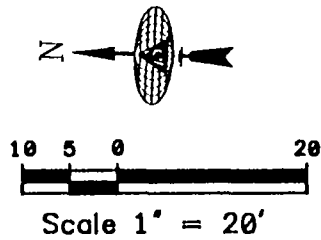
TRPH total petroleum hydrocarbons

NA not analyzed

[^] concentrations reported in micrograms per liter

^{^^} concentrations reported in milligrams per liter

Elevated detection limits were used in the reporting of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene concentrations from sample 300-SB05-0607, due to matrix interference.



DEEP OCEAN ENGINEERING PRESSURE BUILDING

LEGEND

- SB15 SOIL BORING
- | |
|------|
| 1780 |
| 11 |

 TPH-DRO CONCENTRATION (ug/L)
DEPTH OF SAMPLE
- ND NOT DETECTED

500 ug/L DISSOLVED TPH-DRO

HVAC

HVAC

METAL BUILDING

CANOPY

FORMER LOCATION OF
2500 GAL. FUEL OIL TANK

SIDEWALK

ND
11

SB06

ND
11

SB05

1780
11

2830
11

7400
11

SB04

ND
12

SB07

SB12

SB13

875
11

10000
11

TRANS-
FORMER

SB11

ND
11

TRANS-
FORMER

SB14

ND
11

SB15

ND
11

SB08

ND
11

SB02

ND
11

SB03

ND
11

SB10

ND
11

SB01

ND
11

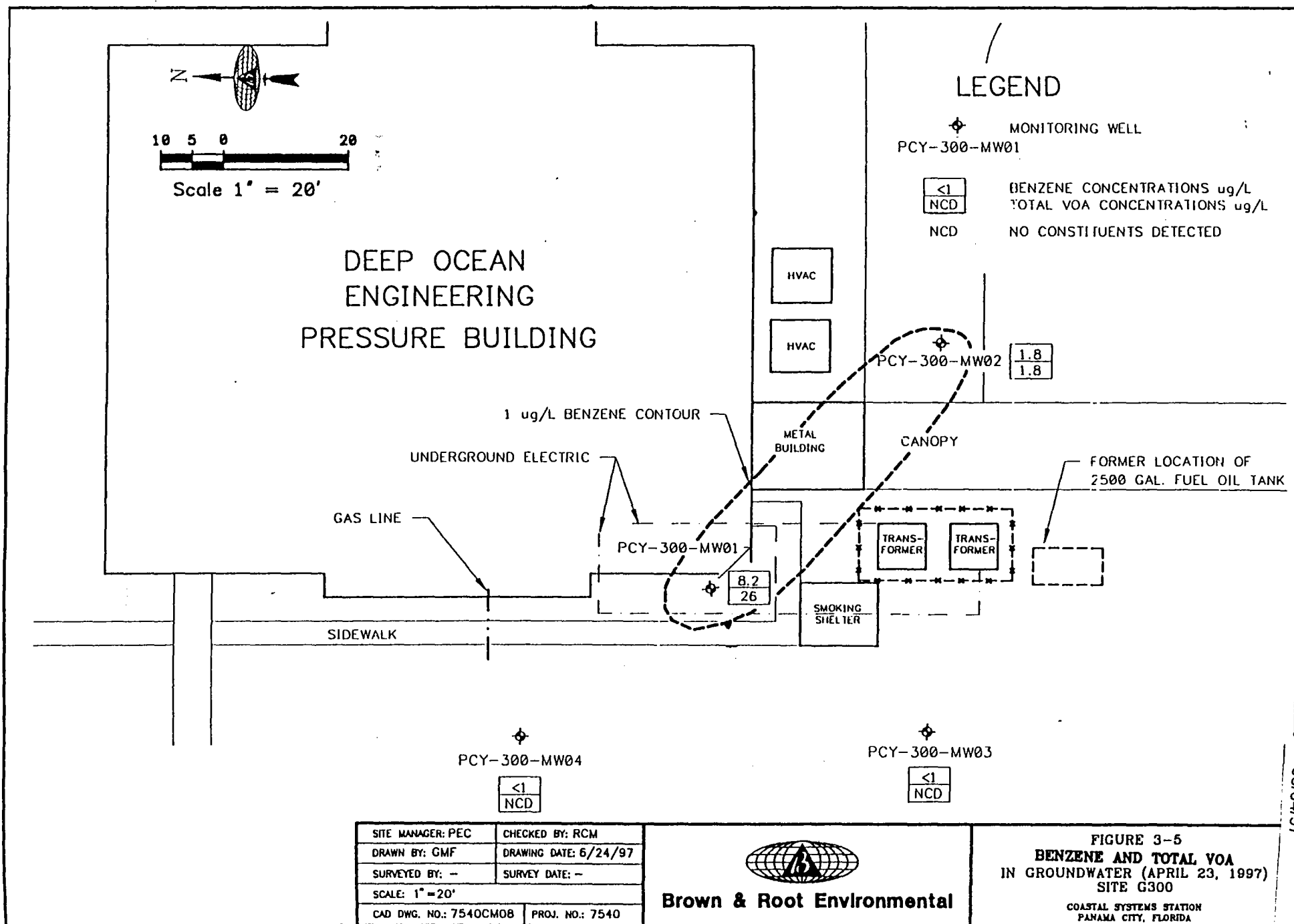
SITE MANAGER: PEC	CHECKED BY: RMC
DRAWN BY: GMF	DRAWING DATE: 6/24/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1" = 20'	
CAD DWG. NO.: 7540CM05	PROJ. NO.: 7540



Brown & Root Environmental

FIGURE 3-4
TPH-DRO CONCENTRATION IN
GROUNDWATER SITE G300

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



Low concentrations of 1,2-dichloroethane were reported in groundwater samples from PCY-300-MW01 and PCY-300-MW02, at concentrations of 2.1 ug/L and 1.7 ug/L, respectively. These concentrations are below the FDEP target level of 3.0 ug/L. Low levels of 1,2-dichloroethane were detected in the trip blank and equipment blank samples which may have attributed to the levels of 1,2-dichloroethane being detected in the groundwater samples. All other volatile organic halocarbon constituents were reported below laboratory detection limits in the remaining samples.

1,2-dibromoethane (EDB) was reported below laboratory detection limits in all samples analyzed.

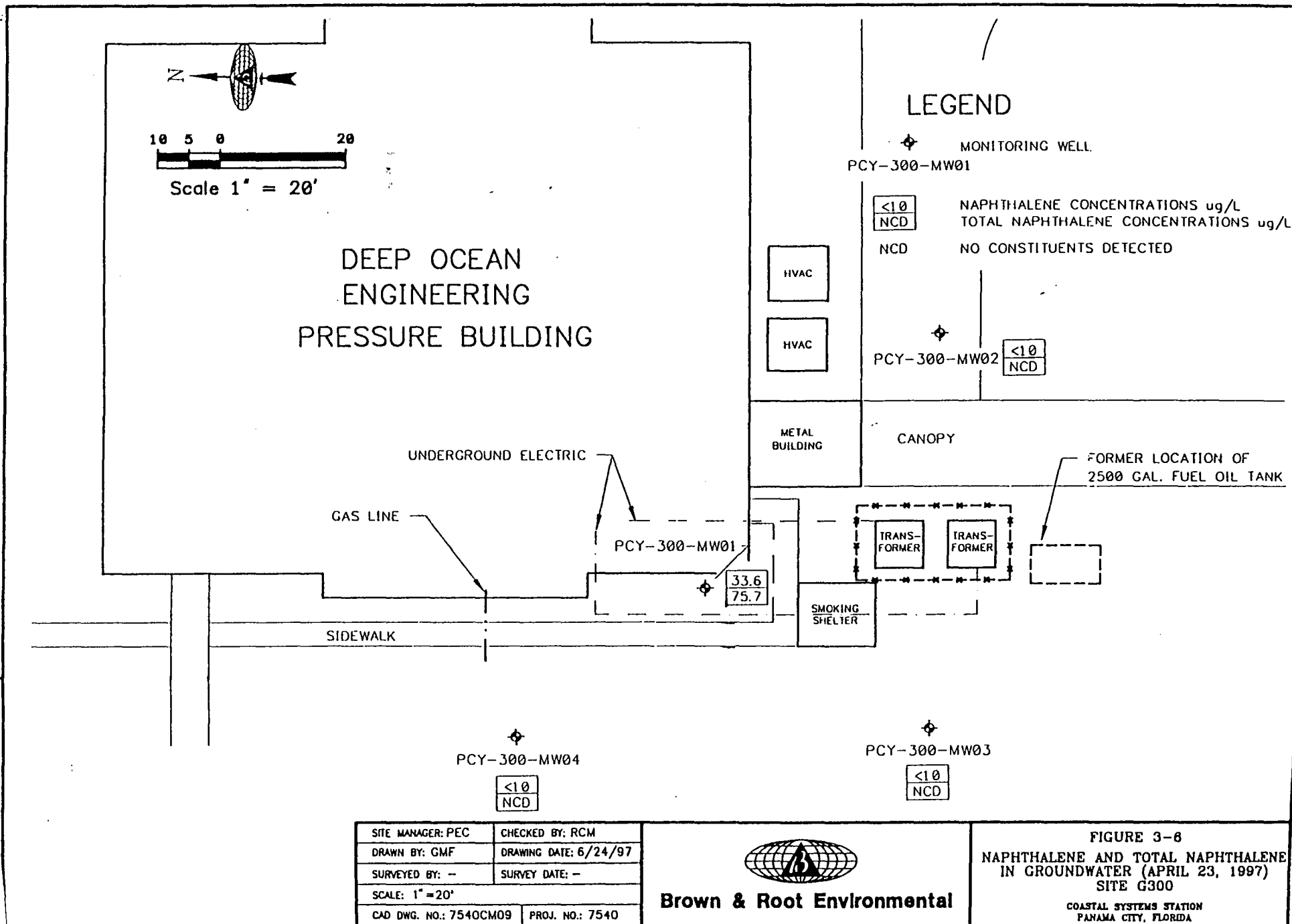
Concentrations of total PAHs (excluding naphthalene and methylnaphthalenes) were below laboratory detection limits in samples from PCY-300-MW01 and PCY-300-MW02, and PCY-300-MW04. A naphthalene concentration of 33.6 ug/L was reported in the groundwater sample collected from PCY-300-MW01. 1-Methylnaphthalene and 2-methylnaphthalene were detected in PCY-300-MW01 at concentrations of 18 ug/L and 24.1 ug/L, respectively. The total naphthalene concentration (sum of naphthalene and methylnaphthalenes) of 75.5 ug/L is below the FDEP target level of 100 ug/L for total naphthalene. Naphthalene and total naphthalene groundwater concentrations are shown on Figure 3-6.

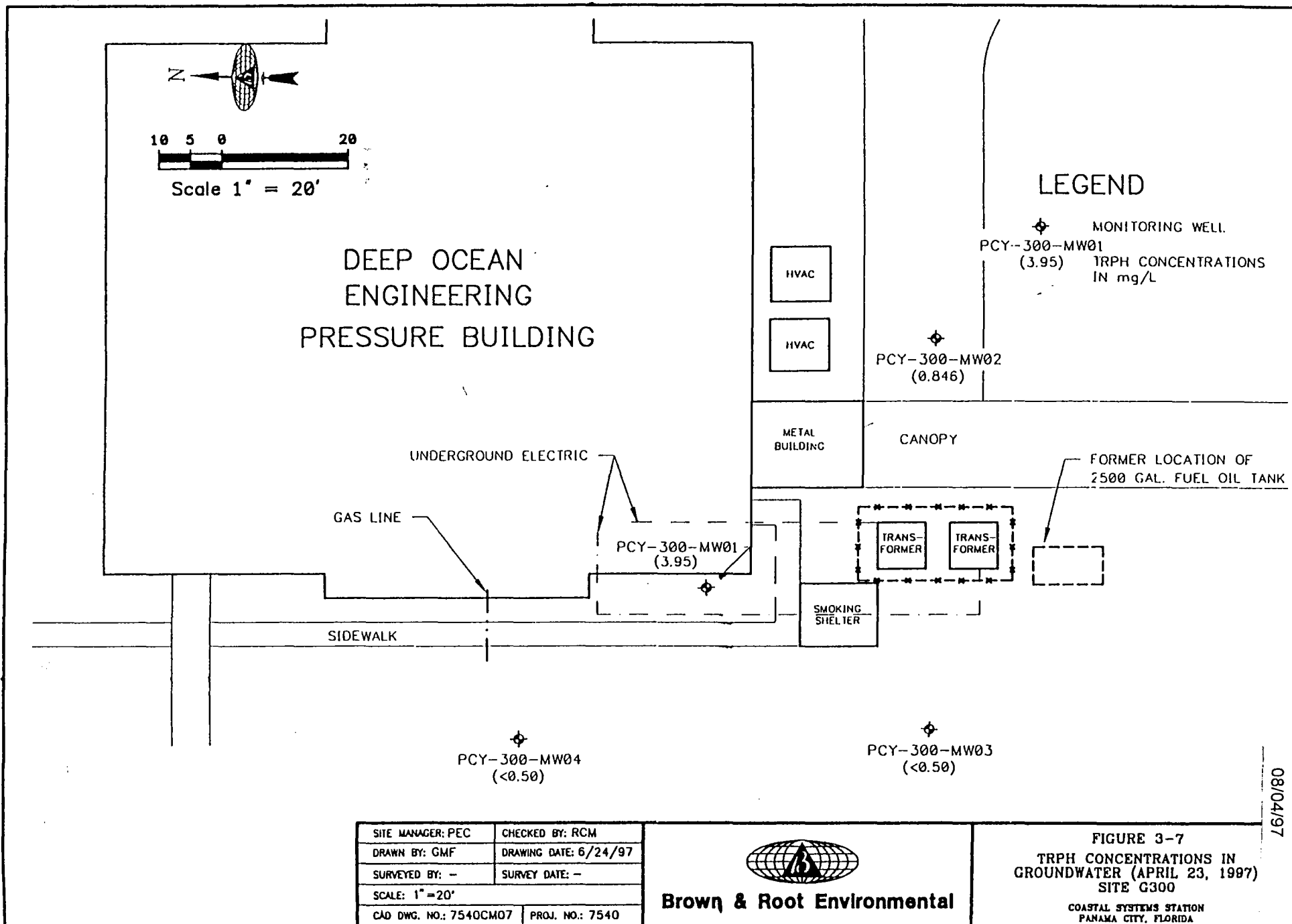
Groundwater samples from PCY-300-MW01 and PCY-300-MW02 detected TRPH concentrations at 3.95 mg/L and 0.846 mg/L, respectively. These concentrations are at levels below the TRPH target level of 5 mg/L. Groundwater TRPH concentrations are depicted on Figure 3-7.

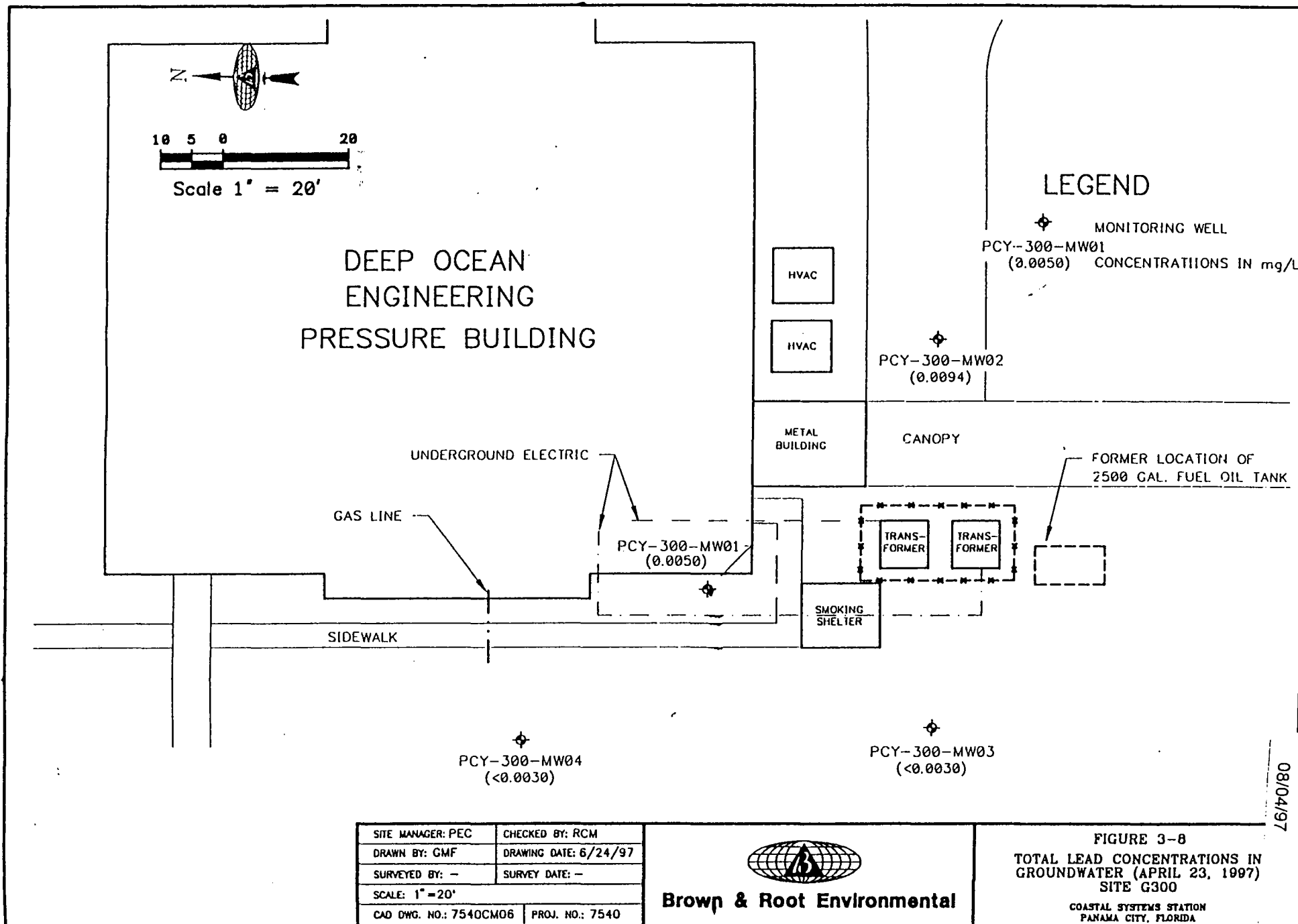
Total lead was detected in groundwater samples from PCY-300-MW01 and PCY-300-MW02 at concentrations of 0.005 mg/L and 0.0094 mg/L, respectively. These concentrations are below the target level for lead established at 0.05 mg/L. Total lead groundwater concentrations are provided on Figure 3-8.

A summary of groundwater analytical results from the April 23, 1997 sampling event are presented in Table 3-3. Groundwater laboratory analytical results are provided as Appendix N. Field sampling forms are included in Appendix K.

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08/04/97

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TABLE 3-3
SUMMARY OF GROUNDWATER QUALITY:
SELECTED PARAMETERS FROM THE KEROSENE
ANALYTICAL GROUP
Site G300
Coastal Systems Station, Panama City, Florida
FDEP ID No. 038518667

Well ID	Date Sampled	Benzene (µg/L)	Total VOA (µg/L)	MTBE (µg/L)	DCE (µg/L)	EDB (µg/L)	Naphthalene (µg/L)	Total Naphthalenes (µg/L)	TRPH (mg/L)	Lead Unfiltered Samples (mg/L)
PCY-300-MW01	04/23/97	8.2	26	< 1.0	2.1	<0.02	33.6	75.7	3.95	0.0050
PCY-300-MW02	04/23/97	1.8	1.8	< 1.0	1.7	<0.02	<10	NCD	0.846	0.0094
PCY-300-MW03	04/23/97	<1.0	NCD	<1.0	<1.0	<0.02	<10	NCD	<0.50	<0.0030
PCY-300-MW04	04/23/97	<1.0	NCD	<1.0	2.2	<0.02	<10	NCD	<0.50	<0.0030
Equipment Blank	04/23/97	< 1.0	NCD	< 1.0	1.4	<0.02	<10	NCD	<0.50	<0.0030
Trip Blank	04/17/97	< 1.0	NCD	< 1.0	2.7	NA	NA	NA	NA	NA

NOTE

NA not analyzed

Total VOA total volatile organic aromatics = sum of benzene, toluene, ethylbenzene, and xylenes

MTBE methyl tert-butyl ether

DCE 1,2-Dichloroethane

EDB 1,2-Dibromoethane = ethylene dibromide

NCD no constituents detected

TRPH total petroleum hydrocarbons

4.0 DISCUSSION

"Excessively contaminated" soil, as defined by Chapter 62-770.200 FAC, was detected within the vadose zone by B&R Environmental during this CA. The "excessively contaminated soil" was identified at depths of 6 to 7 feet bls in an area adjacent to the day tank vent line which extends along the southwest corner of Building 300. These soils exhibited hydrocarbon staining, emitted diesel like odors, and generated headspace readings of greater than 50 ppm. Soil vapor analysis and TPH-DRO concentrations from the soil samples indicate the areal extent of "excessively contaminated soil" is limited to a small area south and southwest of the southwest corner of Building 300. The proximity of the building and the building's footers to the soil contamination makes it impractical to assess soil conditions beneath the building and/or remove the soil without adversely impacting the structural integrity of the building. "Excessively contaminated soil" at the southwest corner of the building was excavated to approximately 5 feet bls during the Tank Closure Assessment. This has minimized the amount of hydrocarbons available to leach from the soil matrix into the groundwater. Soil contamination, if present under the building, would be capped by the building foundation, restricting precipitation from percolating through the vadose zone soils, and would retard the leaching of petroleum hydrocarbons into the groundwater beneath the building. No hydrocarbon vapors were detected in soil samples collected during the Tank Closure Assessment for the 2,500 gallon diesel UST. The 2,500 gallon UST was located approximately 40 feet south of the southwest corner of Building 300. The absence of soil contamination near the former 2,500 gallon UST supports the overspill at the day tank vent line as being the point source for the diesel release. No free product was encountered during the CA.

Laboratory analysis of groundwater samples collected during the CA indicate dissolved hydrocarbon concentrations above FDEP target levels for benzene are present in the groundwater at the site. The highest benzene concentration of 8.2 ug/L was detected in source well PCY-300-MW01. Benzene was reported at a concentration of 1.8 ug/L in downgradient delineation well PCY-300-MW02, slightly above the FDEP target level of 1 ug/L. Benzene was reported at non-detectable levels in groundwater samples analyzed from the remaining perimeter wells. Naphthalene above the method detection limit was only detected in the source well PCY-300-MW01. Naphthalene and total naphthalenes were reported at non-detectable levels in groundwater samples from the remaining perimeter wells. The dissolved hydrocarbon plume appears to be oblate in shape and approximately 50 feet long by 20 feet wide. The plume is delineated by monitoring wells PCY-300-MW02, PCY-300-MW03 and PCY-300-MW04. Based on

petroleum hydrocarbon concentrations detected in monitoring wells downgradient from the site, Alligator Bayou does not appear to be threatened by the levels of hydrocarbons detected at the site.

The predominant soil type of the surficial aquifer is sand. No vertical delineation wells were installed due to the initial response activities to remove "excessively contaminated" soil at the time the surface spill was detected and the relatively low concentrations of dissolved hydrocarbons detected in the groundwater during the CA investigation.

Depth to water in the surficial aquifer was determined to be approximately 8 feet bls. No subsurface utilities were identified within the area of the dissolved hydrocarbon plume which could potentially intersect the water table and provide a preferential pathway for the migration of dissolved hydrocarbons. Subsurface gas, telephone, electric, and sewer lines were identified in the area however these utilities are typically completed at depths of 4 feet bls. The direction of groundwater flow for the surficial aquifer is toward the south-southeast toward Alligator Bayou. The groundwater flow velocity was calculated at 0.34 feet/day. The total dissolved solids content in the surficial aquifer in the area of CSS qualifies the aquifer as a G-II aquifer (Chapter 62-3.403 FAC).

The effects of tidal influence on the groundwater flow direction at the site is negligible. A sea wall constructed at Alligator Bayou restricts the natural flow of groundwater in the area and limits the effects of tidal influence. Alligator Bayou acts as the natural discharge point for the surficial aquifer downgradient of the site. However, the seawall does create a vertical component of groundwater flow as groundwater which normally discharges to the bayou tries to flow under and/or along the seawall.

No well fields and surface water intakes which supply drinking water to the local area are located within a 0.50-mile radius of the site. No domestic water wells were identified within 0.25-mile of the site. Surface water bodies and freshwater aquifers utilized in the study area are not likely to be threatened by the levels of hydrocarbons detected at the site.

5.0 CONCLUSIONS AND RECOMMENDATION

The results of the CA at CSS Building 300 suggest the following:

- Groundwater in the surficial aquifer at the site has a G-II classification;
- Private potable water wells were not identified within 0.25-mile radius of the site. Municipal well fields were not identified within a 0.50-mile radius of the site;
- During the CA "excessively contaminated" soil was encountered at 6 to 7 feet bls adjacent to the northwest corner of Building 300 near the day tank vent line.
- Given the close proximity of the excessively contaminated soil to Building 300, removal of the soil is impractical due to the potential impact on the structural integrity of the building; and
- Free product was not encountered at the site.

Analysis of groundwater samples from site monitoring wells show naphthalene being detected in groundwater above the State Target Level of 10 ug/L in monitor well PCY-300-MW01 and total naphthalene in the well at a concentration below the State Target Level of 100 ug/L. Naphthalene and total naphthalene were detected in PCY-300-MW01 at concentrations of 22.6 ug/L and 75.7 ug/L respectively. Well PCY-300-MW01 was the only well where concentrations of naphthalenes were detected in groundwater samples.

The remaining Kerosene Analytical Group parameters analyzed from groundwater samples were at non-detectable concentrations and/or at concentrations below FDEP target levels. Kerosene and Gasoline Analytical Group groundwater concentration criteria for No Further Action (NFA) criteria for G-II aquifer without wells is presented in Table 5-1 (FDEP, 1990).

Laboratory analytical results for groundwater samples indicate that the dissolved hydrocarbon concentrations meet the criteria established for No Further Action (NFA), as established in the FDEP's, October 1990, "No Further Action and Monitoring Only Guidelines for Petroleum Contaminated Sites", for all constituents of the Kerosene Analytical Group.

Evaluation of soil assessment data indicates that "excessively contaminated" soil, as defined by Chapter 62-770.200, FAC, is present at the site. The areal extent of the excessively contaminated soil is limited to a small area adjacent to the southwest corner of building 300, and

extends approximately 3 to 4 feet below the building footer. The proximity to the building footer makes it impracticable to remove the soil without adversely impacting the structural integrity of the building.

Although the dissolved hydrocarbon concentrations meet the criteria established for NFA, the site does not qualify for NFA due to the presence of excessively contaminated soil. Since it is impracticable to remove the excessively contaminated soil, it is recommended that a Monitoring Only Program (MOP) be implemented at the site. The MOP should include 6 months of monitoring for Total Volatile Organics and Polynuclear Aromatic Hydrocarbons using the following wells.

<u>Monitoring Well</u>	<u>Rationale</u>
PCY-300-MW01	Source well in area of highest dissolved hydrocarbons
PCY-300-MW02	Downgradient area of dissolved hydrocarbons
PCY-300-MW04	Upgradient of the area of dissolved hydrocarbons

If the dissolved hydrocarbon concentrations remain at or below NFA levels for two consecutive quarterly sampling events the site should be considered for NFA status.

TABLE 5-1
MAXIMUM ACCEPTABLE GROUNDWATER CONSTITUENT LEVELS
Site G300
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667

Analyte or Analytical Method	Highest Ground Water Constituent Level in Site Monitoring Wells	No Further Action		Monitoring Only			
		G-II Aquifer (with wells)	G-II Aquifer (without wells)	G-II Aquifer with wells		G-II Aquifer without wells	
				source	perimeter	source	perimeter
Total BTEX	26	50	50	500	50	1000	50
Benzene	8.2	1	50	250	1	500	50
TRPH	3.95^	5^	5^	50^	5^	100^	5^
Lead	9.4	50	50	500	50	1^	50
EDB	<0.02	0.02	0.02	0.02	0.02	0.4	0.02
Total Naphs	75.7	100	100	1000	100	2000	100
EPA 610	<10	DL	DL	10xDL	DL	20xDL	DL
EPA 601	2.1	3.0	3.0	10xDW-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
Arsenic	NA	50	50	500	50	1^	50
Cadmium	NA	10	10	100	10	200	10
Chromium	NA	50	50	500	50	1^	50
EPA 624	NA	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
EPA 625	NA	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs

Note

All data in µg/L unless otherwise noted

^ data in mg/L

Source: monitoring wells near suspected hydrocarbon source

Perimeter: Monitoring wells located at perimeter of plume

TRPH: Total Recoverable Petroleum Hydrocarbons

Total Naphs: sum of naphthalenes and methylnaphthalenes

DW-SRLs: Drinking Water Standards or Applicable Site Rehabilitation Levels

DL: Detection Limit

NCD No Constituents Detected

NA Not Analyzed

6.0 REFERENCES

- ABB Environmental Services, Inc., 1995, RCRA Facility Investigation, Coastal Systems Station
Panama City, Florida.
- Bouwer, H 1989. The Bouwer and Rice Slug Test - an Update. *Groundwater*, v. 27, pp. 304-309.
- Bouwer, H. and R.C. Rice. 1976, A Slug Test for Determining Hydraulic Conductivity of
Unconfined Aquifers with Complete or Partially Penetrating Wells. *Water Resources*, V.
12, pp. 423-428.
- Commanding Officer, Navy Experimental Diving Unit, Summary of the Command Investigation
of the Building 300 Fuel Spill of 7 Sep 96, October 31, 1996.
- Duffield, G.M., and Rumbaugh, J.O. 1991. AQTESOLV, Aquifer Test Solver, Ver. 1.
- E.C. Jordan Company, 1990, Release Detection Program For Underground Storage Tanks,
Naval Coastal Systems Center, Panama City, Florida.
- Florida Department of Environmental Protection, October 1990. *No Further Action and
Monitoring Only Guidelines for Petroleum Contaminated Sites*. Guidance document
issued by Bureau of Waste Cleanup, Technical Review Section.
- U.S. Geological Survey. Panama City, FLA., Quadrangle 1982. 7.5 minute series, Topographic
Quadrangle Maps of Florida: scale 1:24,000.
- U.S. Geological Survey. Panama City Beach, FLA., Quadrangle 1982. 7.5 minute series,
Topographic Quadrangle Maps of Florida: scale 1:24,000.

APPENDIX A

DISCHARGE NOTIFICATION FORM AND FDEP CORRESPONDENCE



Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Form No. Discharge Reporting Form
 Revision Date: December 12, 1990
 DER Application No. _____
 Date of Discharge: _____

Discharge Reporting Form

Use this form to notify the Department of Environmental Regulation of:

- Results of tank tightness testing that exceed allowable tolerances within ten days of receipt of test result.
- Petroleum discharges exceeding 25 gallons on pervious surfaces as described in Section 17-761.460 F.A.C. within one working day of discovery.
- Hazardous substance (CERCLA regulated), discharges exceeding applicable reportable quantities established in 17-761.460(2) F.A.C., within one working day of the discovery.
- Within one working day of discovery of suspected releases confirmed by: (a) released regulated substances or pollutants discovered in the surrounding area, (b) unusual and unexplained storage system operating conditions, (c) monitoring results from a leak detection method or from a tank closure assessment that indicate a release may have occurred, or (d) manual tank gauging results for tanks of 550 gallons or less, exceeding ten gallons per weekly test or five gallons averaged over four consecutive weekly tests.

Mail to the DER District Office in your area listed on the reverse side of this form

PLEASE PRINT OR TYPE

Complete all applicable blanks

- DER Facility ID Number: 038518667 2. Tank Number: G300R1 3. Date: 9/17/96
- Facility Name: COASTAL SYSTEMS STATION
 Facility Owner or Operator: U.S. NAVY
 Facility Address: 6703 W. Hwy 98 PANAMA CITY FL 32407-7001
 Telephone Number: (904) 235-5859 County: BAY
 Mailing Address: NAVAL SURFACE WARFARE CENTER COASTAL SYSTEMS STATION, CODE 051E
- Date of receipt of test results or discovery: 9/17/96 month/day
- Method of initial discovery. (circle one only)
 A. Liquid detector (automatic or manual) D. Emptying and Inspection. ☒ F. Vapor or visible signs of a discharge in the vapor space
 B. Vapor detector (automatic or manual) E. Inventory control. G. Closure: _____ (ex
 C. Tightness test (underground tanks only). H. Other: _____
- Estimated number of gallons discharged: 100 - 150 GALLONS
- What part of storage system has leaked? (circle all that apply) A. Dispenser B. Pipe C. Filling D. Tank E. Unknown
OVERFILL
- Type of regulated substance discharged. (circle one)
 A. leaded gasoline D. vehicular diesel L. used/waste oil V. hazardous substance includes pesticides, amines, chlorides and derivatives (write in name of Chemical Abstracts Service CAS number) _____
 B. unleaded gasoline F. aviation gas ☒ M. diesel Z. other (write in name) _____
 C. gasohol G. jet fuel Q. new/lube oil
- Cause of leak. (circle all that apply)
 A. Unknown C. Loose connection E. Puncture G. Spill I. Other (specify) _____
 B. Split D. Corrosion F. Installation failure ☒ H. Overfill
- Type of financial responsibility. (circle one)
 A. Third party insurance provided by the state insurance contractor ☒ C. Not applicable (FEDERAL FACILITY)
 B. Self-insurance pursuant to Chapter 17-769.500 F.A.C. D. None
- To the best of my knowledge and belief all information submitted on this form is true, accurate, and complete.

Michael D. Clayton ENVIR. ENGINEER
 Printed Name of Owner, Operator or Authorized Representative

Michael D. Clayton
 Signature of Owner, Operator or Authorized Representative

Author: McDonald_Arturo at PC-IRM1

Date: 9/26/96 5:29 PM

Priority: Normal

Receipt Requested

TO: Ericson_E@pnsl.dep.state.fl.us at -INTERNET

CC: Cross_Mike at PC-IRMS, Oster_Bill at PC-IRMS, Clayton_Mike at PC-IRM4,
NJUgolini@efdsouth.navy.mil at -INTERNET, Snow_Rick_CDR at PC-IRM2,
Moody_T@pnsl.dep.state.fl.us at -INTERNET

Subject: Initial Remedial Action follow-up report

Dear Mr. Ericson:

This is a follow-up to our letter of September 23, 1996 (faxed on 9/20/96) regarding the initial remedial action in the vicinity of our AST #G300R1.

This initial remedial action was abandoned on 9/23/96 after it became apparent that the amount of excessively contaminated soil was not the result of just the discharge discovered and reported on 9/17/96. We believe that this contamination resulted from various generator day-tank overfills since 1972.

It is our intent at this time to fill the hole with clean backfill and to initiate a Contamination Assessment Report in accordance with F.A.C. Rule 62-770.

If you require additional information at this time, please call me at (904) 234-4743 or Mike Cross at (904) 234-4744. I will be out of the office until Monday, 10/7/96.

Author: Eric Ericson PEN 904/444-8360 <ERICSON_E@pns1.dep.state.fl.us> at -INTERNET

Date: 9/27/96 9:03 AM

Priority: Normal

TO: McDonald_Arturo at PC-IRM1

C: NUZIE_E@dep.state.fl.us at -INTERNET, PINKOVSKY_D@epic.dep.state.fl.us at -INTERNET,

MOODY_T@pns1.dep.state.fl.us at -INTERNET

Subject: Re: Initial Remedial Action - Coastal Systems Station

Regarding the Discharge Reporting Form which reported a 9/17/96 discovery of contamination at Coastal Systems Station (DEP #03/8518667 and Navy Tank #G300R1), this office referred the initial investigation of the discovery to the Bay County Public Health Unit (BCPHU). The BCPHU is under contract with the DEP to investigate initial discoveries of contamination as well as perform annual inspections of all regulated pollutant storage tanks in Bay County, Florida.

Mr. Drew Pinkovsky or his associate from the BCPHU will perform an inspection of this discovery and a letter to perform a Florida Chapter 62-770 Remedial Action should be sent by his office. From that point on, our Federal Facilities Coordinator, Mr. Eric Nuzie will become your point of contact related to submittals and reviews of Chapter 62-770 technical documents. In the Pensacola DEP District Office, we are concerned about what happens in our District, but we feel that it would be most appropriate if you eliminated us, the "middleman" from your technical document submittals.

Although you will be submitting the Chapter 770 cleanup documents to Mr. Nuzie, if it is possible, will you please send copies of your letters of transmittals to Mr. Nuzie to us at our District Office? Sending the District Office copies of the letters of transmittals is not required, but it will help us monitor your progress.

If we can help, please feel free to call.

Drew Pinkovsky - Bay County Public Health Unit - (904) 872-4815
Eric Nuzie - FDEP Federal Facilities Coordinator - (904) 488-3935
Eric Ericson - FDEP Northwest District - (904) 444-8360

Thanks,

Eric Ericson, Supervisor
Storage Tank Section

APPENDIX B

CAR SUMMARY SHEET

CONTAMINATION ASSESSMENT REPORT SUMMARY SHEET

Facility Name: Coastal Systems Station, Site G300 Reimbursement Site: ☐

Location: Panama City, Florida State Contract Site: ☐

EDI #: _____ FAC I.D.# 038518667 Other: Non-Prog. ☒

Date Reviewed: _____ Local Government: _____

(1) Source of Spill: Day tank vent line Date of Spill: 07 Sep 96

(2) Type of Product: Gasoline Group Gallons Lost Kerosene Group Gallons Lost

<input type="checkbox"/> <u>Leaded</u> _____ <input type="checkbox"/> <u>Unleaded Regular</u> _____ <input type="checkbox"/> <u>Unleaded Premium</u> _____ <input type="checkbox"/> <u>Gasohol</u> _____ <input type="checkbox"/> <u>Undetermined</u> _____	<input type="checkbox"/> <u>Kerosene</u> _____ <input checked="" type="checkbox"/> <u>Diesel</u> <u>≈ 132 gal</u> <input type="checkbox"/> <u>JP-4 Jet Fuel</u> _____ <input type="checkbox"/> <u>Jet A Fuel</u> _____ <input type="checkbox"/> <u>Unknown</u> _____
---	--

(3) Description of IRA: IRA soil excavation started adjacent to building but discontinued due to potential impact to structural integrity of building.

☐ Free product Removal: _____ (gals)
☒ Soil Removal: unknown (cubic yds)
☐ Soil Incineration: _____ (cubic yds)

(4) Free Product still present (yes/no) No Maximum apparent product thickness: N/A (feet)

(5) Maximum Groundwater contamination levels (ppb):

Total VOA: <u>26</u>	benzene: <u>8.2</u>	EDB: <u>< 0.020</u>
lead: <u>9.4</u>	MTBE: <u><1.0</u>	other: <u>TRPH & NAPs</u>

(6) Brief lithologic description: Light gray to white to yellowish orange, fine grained sand to 15 bls at which point borings terminated.
clayey sand and sandy clay w/ abundant shell fragments, no significant lithologic variations across site.

(7) Areal and vertical extent of soils contamination defined (yes/no) yes

Highest current soil concentration (OVA: 300 ppm) or (EPA method 5030/8020: 4320 ppb)

(8) Lower aquifer contaminated? (yes/no) - Depth of vertical contamination: No vertical extent well installed

(9) Date of last complete round of groundwater sampling: 4/23/97 Date of last soil sampling: 4/23/97

(10) QAPP approved? (yes/no) Date: 6/16/96

(11) Direction (e.g. NNW) of surficial groundwater flow: SSE (Figure 3-1 on page 3-3)

(12) Average depth to groundwater: 8 (ft)

(13) Observed range of seasonal groundwater fluctuations: @ 1 (ft) (Based on water level data collected during the CAR investigation)

(14) Estimated rate of groundwater flow: 0.34 (ft/day)

(15) Hydraulic gradient across site: 0.01 (ft/ft)

(16) Aquifer characteristics:	Values	Units	Method
Hydraulic conductivity	<u>10.24</u>	<u>ft/day</u>	<u>Bouwer & Rice, 1976</u>
Storage coefficient	<u>-</u>	<u>ft/ft</u>	<u>-</u>
Aquifer thickness	<u>48</u>	<u>ft</u>	<u>Effective aquifer thickness taken as depth from surficial aquifer to top of Intracoastal Formation (literature)</u>
Effective soil porosity	<u>30</u>	<u>%</u>	<u>Literature</u>
Transmissivity	<u>368</u>	<u>gal/day/ft</u>	<u>T = Kb</u>

(17) Other remarks: None

APPENDIX C

TANK CLOSURE ASSESSMENT REPORT

CLOSURE ASSESSMENT
UNDERGROUND STORAGE TANK
BUILDING 300

NAVAL SURFACE WARFARE CENTER
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Unit Identification Code: N61331

Prepared by:

Navy Public Works Center
Environmental Department
310 John Tower Road
Pensacola, Florida, 32508

Prepared for:

Commanding Officer, Coastal Systems Station
Dahlgren Division, Naval Surface Warfare Center
6703 West Highway 98
Panama City, Florida 32407-7001

Mr Mike Clayton, Code 051EMC, Environmental Engineer

April 1997

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Underground Storage Tank
Building 300
Coastal Systems Station
Panama City, Florida

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12.0	Recommendations	2
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15.0	Project Number	2
16.0	Report Date	2

FIGURES

Figure 1: Vicinity Map

Figure 2: Site Map

ATTACHMENTS

Attachment A: Application for Closure of Pollutant Storage Tank System

Attachment B: Underground Storage Tank Installation and Removal Form

Attachment C: Closure Assessment Form, Groundwater Analysis, & OVA
Readings

Attachment D: Decontamination Certification

GLOSSARY

FAC	Florida Administrative Code
OVA	Organic Vapor Analyzer
AST	Aboveground Storage Tank
UST	Underground Storage Tank
USEPA	U.S. Environmental Protection Agency

CLOSURE ASSESSMENT REPORT
UNDERGROUND STORAGE TANK
BUILDING 300

1.0 Facility

Building 300
Naval Surface Warfare Center
Coastal Systems Station
Panama City, Bay County, Florida

2.0 Operator

Commanding Officer, Coastal Systems Station
Dahlgren Division, Naval Surface Warfare Center
6703 West Highway 98, Code 051 EMC
Panama City, Florida 32407-7001

3.0 Site Location

See Figure 1.

4.0 Date of Closure

17 September 1996

5.0 Tank Status

There was one 2500 gallon underground storage tank (UST) removed from the southwest corner of Building 300 by the Public Works Center (PWC) as depicted by Figure 2. The UST was emptied prior to commencement of work by the Coastal Systems Station (CSS). The UST was completely decontaminated and rendered unuseable by PWC. The UST was properly disposed as scrap metal.

6.0 Tank Contents

Diesel

7.0 Tank Condition

The UST was in good condition at the time of removal.

8.0 Tank Area

The size of the excavation, was approximately twelve (12) feet wide by twenty (20) feet long and eight (8) feet deep. The excavation was filled with clean fill and compacted to grade.

9.0 Soil Screening

- Seven (7) soil samples were collected for headspace screening with an organic vapor analyzer (OVA). The samples were extracted at each side and underneath the UST is depicted by Figure 2.
- The soil screening was conducted in accordance with the headspace screening criteria in Chapter 62-770 FAC and PWC's Comprehensive Quality Assurance Plan.

10.0 Groundwater Analysis

A temporary groundwater monitoring well was placed at the center of the UST excavation, the well was developed and groundwater samples were collected on 25 March 1997. The samples were transported to the PWC Laboratory in Pensacola, Florida. The samples were analyzed using U.S. Environmental Protection Agency (EPA) Methods 8260 and 8270.

11.0 Conclusions

There were no indications of petroleum contamination noted above the state target levels for storage tank closures.

There were low levels of Chloroform, Bromodichloromethane, and Dibromochloromethane. The levels were below the State of Florida Drinking Water Standards (62-550.310 (2)(a)). There may be a leak in the local water supply or water treatment systems.

12.0 Recommendations

No further action.

13.0 Closure Assessment

Performed by the Public Works Center (PWC) Pensacola, Florida.

14.0 Project Manager

Mr. Paul R. Semmès, P.E.

15.0 Project Number

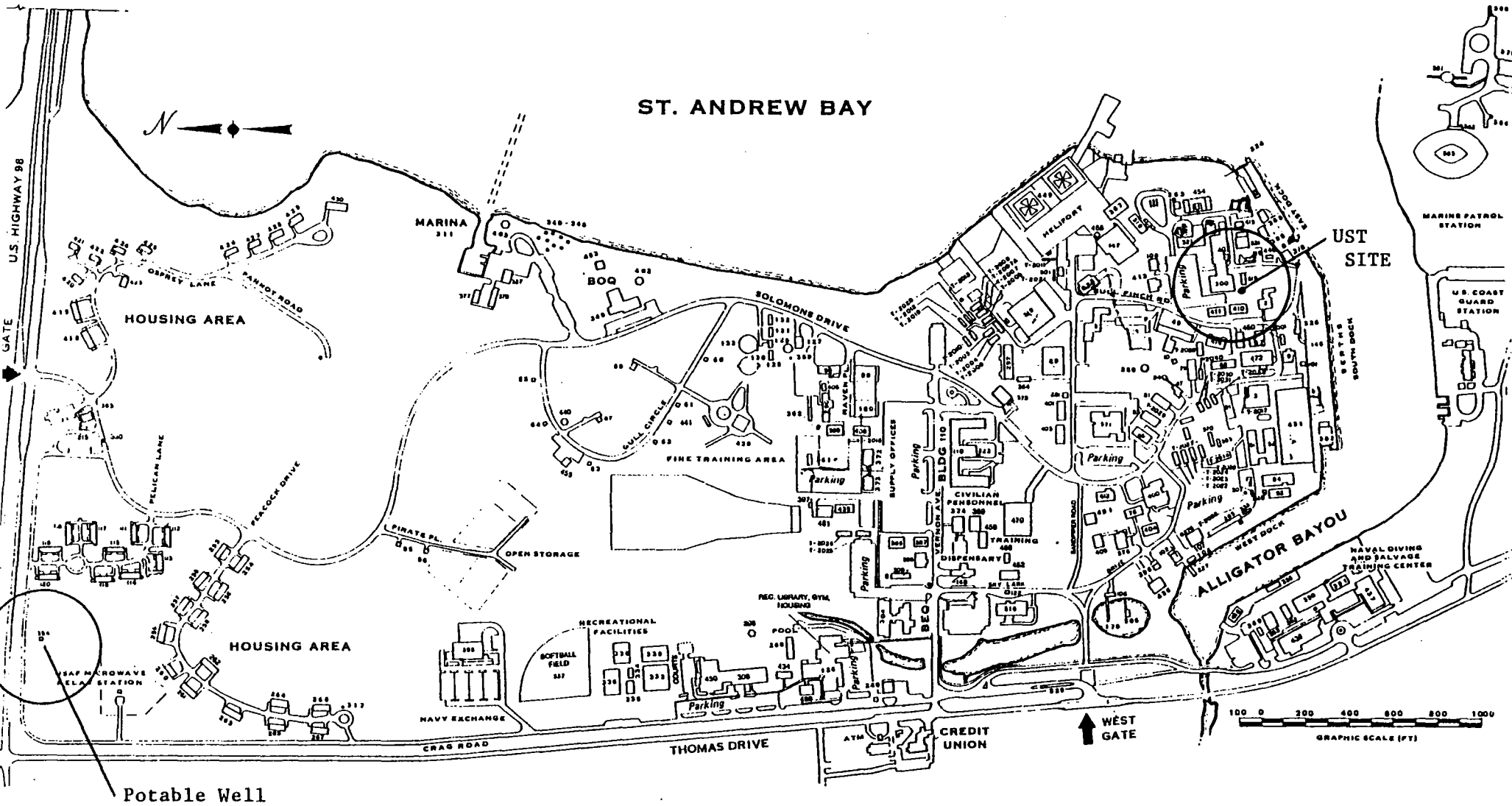
1395003

16.0 Report Date

21 April 1997

Figures

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

BLDG 300

FENCE

F

UST

G

OVA READINGS

A- 4' BLS, 0 PPM
 B- 4' BLS, 0 PPM
 C- 2' BLS, 0 PPM
 D- 8' BLS, 0 PPM
 E- 8' BLS, 0 PPM
 F- 8' BLS, 0 PPM
 G- 8' BLS, 0 PPM

REF. BLDG 400		DEPARTMENT OF THE NAVY, NAVAL FACILITIES ENGINEERING COMMAND	
DESIGNED _____		NAVY PUBLIC WORKS CENTER	
DRAWN _____		NAVAL AIR STATION PENSACOLA, FLORIDA	
CHECKED _____		NAVAL SURFACE WARFARE CENTER	
ENV. DIR. _____		COASTAL SYSTEMS STATION	
LDO. DIV. DIR. _____		PANAMA CITY, FLORIDA	
ENGRG. DEPT. NO. _____			
APPROVED _____	DATE _____	SIZE CODE IDENT. NO.	ENVIRON. DEPT. NO.
ENVIRONMENTAL DEPARTMENT	DATE _____	900	
APPROVED _____	DATE _____	SCALE AS SHOWN	SPEC.
PAUL E. SENGES, P.E.		SHEET OF	

Attachments

APPLICATION FOR CLOSURE OF POLLUTANT STORAGE TANK SYSTEM

Provide the facility information requested below.

FDEP Facility # 03/8518667 Facility Name U. S. Navy

Facility Location Naval Surface Warfare Center, Coastal Systems Station

Property Owner Commanding Officer, NSWCCSS (Code CP2F)

Property Owner Address 6703 West Highway 98, Panama City, FL 32407-7001

Phone (904) 235-5859

Method of Tank Closure Removal

Pollutant Storage Systems Specialty Contractor (PSSSC) who will be on site supervising closure activities. Attach copy of PSSSC license.

Individual Licensed as PSSSC N/A PSSSC # N/A

Firm U.S. Navy - Public Works Center (PWC)

Address 310 John Tower Road, Pensacola, FL 32508

Indicate the firm(s) that will degas, remove, and transport the tank(s), and the method of degassification.

Degassification Method Air Eduction (API 1604-4.2.5)

Firm Removing Tanks U.S. Navy - Public Works Center (PWC)

Contact Mr. Paul Semmes, P.E. Phone (904) 293-0635

Firm Transporting Tanks U. S. Navy - Public Works Center (PWC)

Contact Mr. Paul Semmes, P.E. Phone (904) 293-0635

Firm Receiving Tanks for Ultimate Disposal U.S. Navy - DRMO

Contact Ms. Gayle Brown Phone (904) 452-3459

Indicate the laboratory that will conduct groundwater analysis.

Contracted Laboratory U.S. Navy - PWC Phone (904) 452-4728

Contact Mr. Joe Moore FDEP QA/QC 920121G

Indicate firm(s) transporting and disposing of contaminated soils.

Firm Transporting Soils N/A

Contact _____ Phone _____

Firm Remediating/Disposing Soils _____

Contact _____ Phone _____

Disposal/Remediation Method _____

Indicate the firm(s) that will transport and ultimately dispose of residual product and sludge from the tanks.

Firm Transporting Residual Product and Sludge U.S. Navy - PWC

Contact Mr. Jerry Levins Phone (904) 452-8237

Firm Receiving/Disposal Residual Product and Sludge DRMO

Contact Ms. Gayle Brown Phone (904) 452-3459

Indicate the firm and names of personnel that will conduct field sampling.

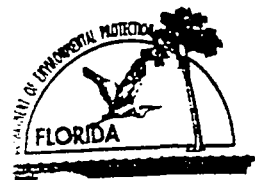
Contracted Firm U.S. Navy - Public Works Center (PWC)

Contact Mr. Paul Semmes, P.E. Phone (904) 293-0635

Person (s) Sampling Mr. Paul Semmes, P.E.

Equipment used for soil screening (Specific Make and Model) Organic Vapor Analyzer

(OVA) Thermo Environmental (680 HVM) equipped w/Flame Ionization Detector (FID).



Florida Department of Environmental Protection

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DEP Form # <u>62-761.900(5)</u>
Underground Storage Tank Installation Form Title <u>Removal Form for Certified Contractors</u>
Effective Date <u>December 10, 1990</u>
DEP Application No. _____ (Filed in by DEP)

Underground Storage Tank Installation and Removal Form For Certified Contractors

Pollutant Storage Systems Contractor as defined in Section 489.105, Florida Statutes (certified contractors as defined in Section 62-761.200, Florida Administrative Code) shall use this form to certify that the installation, replacement or removal of the storage tank system(s) located at the address listed below was performed in accordance with Department Reference Standards.

General Facility Information

1. DEP Facility Identification No.: 03/8518667
2. Facility Name: US NAVY - NSWC, CSS Telephone: (904) 235-5859
3. Street Address (physical location): 6703 WEST HIGHWAY 98, PANAMA CITY, FLORIDA 32407 - 7001
4. Owner Name: COMMANDING-OFFICER, NSWC, CSS Telephone: (904) 235-5859
5. Owner Address: CO, NSWC, SS (CODE CP25) 6703 WEST HIGHWAY 98, PANAMA CITY, FL 32407
6. Number of Tanks: a. Installed at this time 0 b. Removed at this time 1
7. Tank(s) Manufactured by: UNKNOWN
8. Date Work Initiated: 17 SEPTEMBER 1996 9. Date Work Completed: 17 SEPTEMBER 1996

Underground Pollutant Tank Installation Checklist

Please certify the completion of the following installation requirements by placing an (X) in the appropriate box.

1. The tanks and piping are corrosion resistant and approved for use by State and Federal Laws. ☐
2. Excavation, backfill and compaction completed in accordance with NFPA (National Fire Protection Association) 30(96), API (American Petroleum Institute) 1615, PEI (Petroleum Equipment Institute) RP100-94 and the manufacturers' specifications. ☐
3. Tanks and piping pretested and installed in accordance with NFPA 30(96), API 1615, PEI/RP100-94 and the manufacturers' specifications. ☐
4. Steel tanks and piping are cathodically protected in accordance with NFPA 30(96), API 1632, UL (Underwriters Laboratory) 1746, STI (Steel Tank Institute) R892-89 and the manufacturers' specifications. ☐
5. Tanks and piping tested for tightness after installation in accordance with NFPA 30(96) and PEI RP100-94. ☐
6. Monitoring well(s) or other leak detection devices installed and tested in accordance with Section 62-761.640, Florida Administrative Code (F.A.C.) ☐
7. Spill and overfill protection devices installed in accordance with Section 62-761.500, F.A.C. ☐
8. Secondary containment installed for tanks and piping as applicable in accordance with Section 62-761.500, F.A.C. ☐

Please Note: The numbers following the abbreviations (e.g. API 1615) are publication or specification numbers issued by these institutions.

Underground Pollutant Tank Removal Checklist

1. Closure assessment performed in accordance with Section 62-761.800, F.A.C. ☒
2. Underground tank removed and disposed of as specified in API 1604 in accordance with Section 62-761.800, F.A.C. ☒

DEP Form # 62-761.920(5)
Underground Storage Tank Installation
Form Title Removal Form for Certified Contractors
Effective Date: December 10, 1999
DEP Application No. _____
(Filled in by DEP)

Certification

I hereby certify and attest that I am familiar with the facility that is registered with the Florida Department of Environmental Protection; that to the best of my knowledge and belief, the tank installation, replacement or removal at this facility was conducted in accordance with Chapter 489 and Section 376.303, Florida Statutes and Chapter 62-761, Florida Administrative Code (and its adopted reference sources form publications and standards of the National Fire Protection Association (NFPA), the American Petroleum Institute (API), the National Association of Corrosion Engineers (NACE), American Society for Testing and Materials (ASTM); Petroleum Equipment Institute (PEI); Steel Tank Institute (STI); Underwriters Laboratory (UL); and the tank and integral piping manufacturers' specifications; and that the operations on the checklist were performed accordingly.

US NAVY - PUBLIC WORKS CENTER, PENSACOLA, FL

(Type or Print)

Certified Pollutant Tank Contractor Name

Pollutant Storage Systems Contractor License Number (PSSC)

Certified Tank Contractor Signature

PAUL R SEMMES, PE
ENVIRONMENTAL ENGINEER

(Type or Print)

Field Supervisor Name

Field Supervisor Signature

NA

PSSC Number

3/28/97

Date

28 MAR 97

Date

3/28/97

Date

The owner or operator of the facility must register the tanks with the Department upon completion of the installation. The installer must submit this form no more than 30 days after the completion of installation to the Department of Environmental Protection at the address printed at the top of page one.



Form Title: Closure Assessment Form
Effective Date: December 10, 1990
DEP Application No. _____
(Filed in by DEP)

Closure Assessment Form

of storage tank systems that are replacing, removing or closing in place storage tanks shall use this form to demonstrate that a storage closure assessment was performed in accordance with Rule 62-761.800(3) or 62-762.800(3), Florida Administrative Code.

Please Print or Type
Complete All Applicable Blanks

1. Date 21 FEBRUARY 1997
2. DEP Facility ID Number: 03/8518667
3. County BAY
4. Facility Name: US NAVY - NAVAL SURFACE WARFARE CENTER, COASTAL SYSTEMS STATION
5. Facility Owner: COMMANDING OFFICER, NSWC CSS, CODE CP2F
6. Facility Address: BUILDING 300, COASTAL SYSTEMS STATION
7. Mailing Address: 6703 WEST HIGHWAY 98, PANAMA CITY, FLORIDA 32407-7001
8. Telephone Number: (904) 235-5859
9. Facility Operator: MR MIKE CLAYTON
10. Are the Storage Tank(s): (Circle one or both) A. Aboveground or B. Underground
11. Type of Product(s) Stored: DIESEL
12. Were the Tank(s): (Circle one) A. Replaced B. Removed C. Closed in Place D. Upgraded (aboveground tanks only)
- Number of Tanks closed: ONE
14. Age of Tanks: _____

Facility Assessment Information

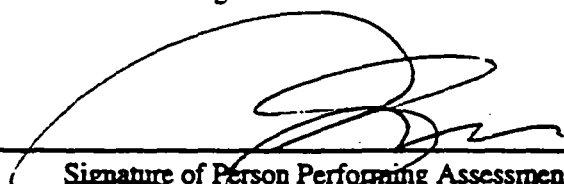
- | Yes | No | Not Applicable | |
|-------------------------------------|-------------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | | 1. Was a Discharge Reporting Form submitted to the Department?
If yes, When: _____ Where: _____ |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | | 2. Is the depth to ground water less than 20 feet? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. Are monitoring wells present around the storage system?
If yes, please specify <input type="checkbox"/> Vapor Monitoring <input type="checkbox"/> Water Monitoring |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Is there free product present in the monitoring wells or within the excavation? |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. Were the petroleum hydrocarbon vapor levels in the soil greater than 500 parts per million for gasoline?
Specify sample type: <input type="checkbox"/> Vapor Monitoring wells <input type="checkbox"/> Soil sample(s) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 6. Were the petroleum hydrocarbon vapor levels in the soils greater than 50 parts per million for diesel/kerosene?
Specify sample type: <input type="checkbox"/> Vapor Monitoring wells <input checked="" type="checkbox"/> Soil sample(s) |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 7. Were the analytical laboratory results of the ground water sample(s) greater than the allowable state target levels?
(See target levels on reverse side of this form and supply laboratory data sheet(s).) |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8. If a used oil storage system, did a visual inspection detect any discolored soil indicating a release? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 9. Are any potable wells located within 1/4 of a mile radius of the facility? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10. Is there a surface water body within 1/4 mile radius of the site? If yes, indicate distance: <u>300 ft.</u> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11. A detailed drawing or sketch of the facility that includes the storage system location, monitoring wells, buildings, storm drains, sample locations, and dispenser locations must accompany this form. |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 12. If a facility has a pollutant storage tank system that has both gasoline and kerosine/diesel stored on site, both EPA method 602 and EPA method 610 must be performed on the ground water samples. |

DEP Form # 62-761.900(1)
Form Title <u>Closure Assessment Form</u>
Effective Date <u>December 18, 1990</u>
DEP Application No. _____ (Filled in by DEP)

13. Amount of soils removed and receipt of proper disposal.
14. If yes is answered to any one of questions 5-9, a Discharge Reporting Form 62-761.900(1) indicating a suspected release shall be submitted to the Department within one working day.
15. A copy of this form and any attachments must be submitted to the Department's district office in your area and to the county within 60 days of completion of tank removal or filling a tank with an inert material.


Signature of Owner

4/30/97
Date


Signature of Person Performing Assessment

2/21/97
Date

PAUL R SEMMES, PE
ENVIRONMENTAL ENGINEER

Title of Person Performing Assessment

State Ground Water Target Levels That Affect A Pollutant Storage Tank System Closure Assessment

1. For Gasoline (EPA Method 602 or equivalent):

a. Benzene 1 ug/l

b. Total VOA 50 ug/l

- Benzene
- Toluene
- Total Xylenes
- Ethylbenzene

c. *tert*-butyl methyl ether (MTBE) 50 ug/l

2. For kerosene/diesel (EPA Method 610 or equivalent):

a. Polycyclic Aromatic Hydrocarbons (PAH)
(Best achievable detection limit, 10 ug/l maximum)

Summary of OVA Readings

Closure Assessment Report Underground Storage Tank Building 300 Coastal Systems Station Panama City, Florida

Hand Auger Sample No.	Depth (Feet)	Unfiltered (ppm)	Filtered (ppm)
SS-1	4	<1	<1
SS-2	4	<1	<1
SS-3	2	<1	<1
SS-4	8	<1	<1
SS-5	8	<1	<1
SS-6	8	<1	<1
SS-7	8	<1	<1

Readings for unfiltered samples are total hydrocarbon readings including methane; readings for filtered samples are methane only.

Notes: ppm = parts per million.

Navy Public Works Center

Environmental Laboratory

Bldg. 3887, Code 920
 NAS Pensacola, FL 32508
 Phone (904) 452-4728/3642
 DSN 922-4728/3642
 FAX (904) 452-2799/2387

Client: NPWC Environmental
 Address: Bldg. 3887, Code 910
 NAS Pensacola, FL 32508
 Phone #: 452-3180
 Contact: Paul Semmes

Analytical Report

Total Volatiles by Method 8260

Lab Report Number: 71246
 Sample Date: 03/25/97
 Received Date: 03/27/97
 Sample Site: Eglin, Tyndall, or CSS-P.C.
 Job Order No.: 181 5004

LAB Sample ID#	1-	71246		
Sample Name / Location		Bldg. 300 MW		
Collector's Name		S. Dueitt, R. Spencer		
Date & Time Collected		03/25/97 @ 1043		
Sample Type (composite or grab)		Grab		
Analyst		J. Moore		
Date of Extraction / Initials		03/27/97 JM		
Date of Analysis		03/27/97		
Sample Matrix		GW		
Dilution		X	1	
Compound Name	1-	71246	units	Det. Limit Flags
Benzene	BDL		ug/L	1
Bromobenzene	BDL		ug/L	1
Bromochloromethane	BDL		ug/L	1
Bromodichloromethane	6		ug/L	1
Bromoform	BDL		ug/L	2
Bromomethane	BDL		ug/L	3
n-Butylbenzene	BDL		ug/L	1
sec-Butylbenzene	BDL		ug/L	1
tert-Butylbenzene	BDL		ug/L	2
Carbon Tetrachloride	BDL		ug/L	1
Chlorobenzene	BDL		ug/L	1
Chloroethane	BDL		ug/L	1
Chloroform	22		ug/L	1
Chloromethane	BDL		ug/L	1
2-Chlorotoluene *	BDL		ug/L	1
4-Chlorotoluene *	BDL		ug/L	1
Dibromochloromethane	1		ug/L	1
1,2-Dibromo-3-chloropropane *	BDL		ug/L	5
1,2-Dibromoethane	BDL		ug/L	1
Dibromomethane	BDL		ug/L	1
1,2-Dichlorobenzene	BDL		ug/L	1
1,3-Dichlorobenzene	BDL		ug/L	1
1,4-Dichlorobenzene	BDL		ug/L	1
Dichlorodifluoromethane	BDL		ug/L	1
1,1-Dichloroethane	BDL		ug/L	1
1,2-Dichloroethane	BDL		ug/L	1
1,1-Dichloroethene	BDL		ug/L	1
cis-1,2-Dichloroethene	BDL		ug/L	1
trans-1,2-Dichloroethene	BDL		ug/L	1
1,2-Dichloropropane	BDL		ug/L	1
1,3-Dichloropropane	BDL		ug/L	1
2,2-Dichloropropane	BDL		ug/L	1
1,1-Dichloropropene	BDL		ug/L	1
Ethylbenzene	BDL		ug/L	1
Ethyl ether *	BDL		ug/L	1
Hexachlorobutadiene	BDL		ug/L	2
2-Hexanone *	BDL		ug/L	1
Isopropylbenzene	BDL		ug/L	1
p-Isopropyltoluene	BDL		ug/L	1

Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920
NAS Pensacola, FL 32508
Phone (904) 452-4728/3642
SN 922-4728/3642
FAX (904) 452-2799/2387

Client: NPWC Environmental
Address: Bldg. 3887, Code 910
NAS Pensacola, FL 32508
Phone #: 452-3180
Contact: Paul Semmes

Analytical Report

Total Volatiles by Method 8260

Lab Report Number: 71246
Sample Date: 03/25/97
Received Date: 03/27/97
Sample Site: Eglin, Tyndall, or CSS-P.C.
Job Order No.: 181 5004

Compound Name	1- 71246	units	Det. Limit	Flags
Methylene Chloride	BDL	ug/L	1	
Methyl ethyl ketone (MEK) *	BDL	ug/L	2	
Methyl isobutyl ketone (MIBK) *	BDL	ug/L	1	
Methyl-tert-butyl ether (MTBE)	BDL	ug/L	1	
Naphthalene	BDL	ug/L	1	
n-Propylbenzene	BDL	ug/L	1	
Styrene	BDL	ug/L	1	
1,1,1,2-Tetrachloroethane	BDL	ug/L	1	
1,1,2,2-Tetrachloroethane	BDL	ug/L	1	
Tetrachloroethene	BDL	ug/L	1	
Toluene	BDL	ug/L	1	
1,2,3-Trichlorobenzene	BDL	ug/L	1	
1,2,4-Trichlorobenzene	BDL	ug/L	1	
1,1,1-Trichloroethane	BDL	ug/L	1	
1,1,2-Trichloroethane	BDL	ug/L	1	
Trichloroethene	BDL	ug/L	1	
Trichlorofluoromethane	BDL	ug/L	1	
1,1,2-Trichloro-1,2,2-Trifluoroethane *	BDL	ug/L	1	
1,2,3-Trichloropropane	BDL	ug/L	1	
1,2,4-Trimethylbenzene	BDL	ug/L	1	
1,3,5-Trimethylbenzene	BDL	ug/L	1	
Vinyl Chloride	BDL	ug/L	1	
m,p-Xylene	BDL	ug/L	1	
o-Xylene	BDL	ug/L	1	

SURROGATE SPIKE RECOVERIES

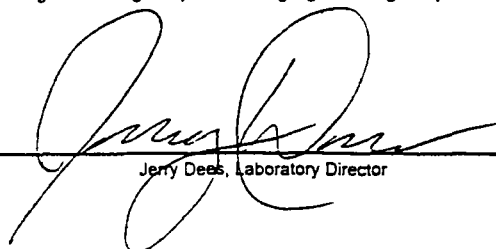
	Acceptance Limits	Percent Recovery
1,2-Dichloroethane-d4	75-133	103
Toluene-d8	86-119	100
Bromofluorobenzene	85-116	102

Explanation of Flags:

COMMENTS :

BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. * = FL HRS certification pending.

Approved by :


Jerry Dees, Laboratory Director

Date: 4/9/97
Report Generated

Navy Public Works Center Environmental Laboratory

Bldg. 3887, Code 920
NAS Pensacola, FL 32508 - 6500
Phone (904) 452-4728/3642
DSN 922-4728/3642

Client: NPWC Environmental
Address: Bldg. 3887, Code 910
NAS Pensacola, FL 32508
Phone #: 452-3180
Contact: Paul Semmes

Analytical Report

610 PAH's by Method 8270

Lab Report Number: 71246
Sample Date: 03/25/97
Received Date: 03/27/97
Sample Site: Eglin, Tyndall, or CSS-P.C.
Job Order No.: 181 5004

LAB Sample ID#	1-	71246		
Sample Name / Location	Bldg. 300 MW			
Collector's Name	S. Dueitt, R. Spencer			
Date & Time Collected	03/25/97 @ 1043			
Sample Type (composite or grab)	Grab			
Analyst	M. Chambers			
Date of Extraction / Initials	03/31/97 JJ			
Date of Analysis	04/02/97			
Sample Matrix	GW			
Dilution	X 1			
Compound Name	1-	71246	units	Det. Limit
Acenaphthene	BDL		ug/L	2
Acenaphthylene	BDL		ug/L	2
Anthracene	BDL		ug/L	2
Benzo(a)anthracene	BDL		ug/L	2
Benzo(a)pyrene	BDL		ug/L	2
Benzo(b)fluoranthene	BDL		ug/L	2
Benzo(g,h,i)perylene	BDL		ug/L	2
Benzo(k)fluoranthene	BDL		ug/L	3
Chrysene	BDL		ug/L	2
Dibenz(a,h)anthracene	BDL		ug/L	2
Fluoranthene	BDL		ug/L	2
Fluorene	BDL		ug/L	2
Indeno(1,2,3-cd)pyrene	BDL		ug/L	2
1-Methylnaphthalene *	BDL		ug/L	2
2-Methylnaphthalene	BDL		ug/L	3
Naphthalene	BDL		ug/L	2
Phenanthrene	BDL		ug/L	2
Pyrene	BDL		ug/L	2

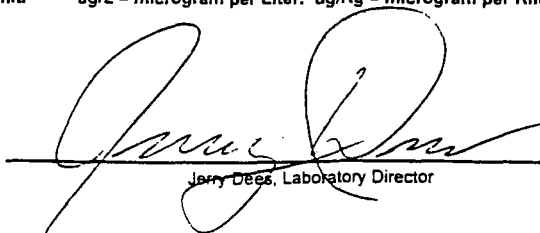
SURROGATE SPIKE RECOVERIES

	Acceptance Limits	Percent Recovery
Nitrobenzene- d5	35-114	72
2-Fluorobiphenyl	43-116	80
Terphenyl -d14	33-141	93

COMMENTS :

BDL = Below Detection Limit. ug/L = microgram per Liter. ug/Kg = microgram per Kilogram. * = FL HRS certification pending.

Approved by :


Jerry Dees, Laboratory Director

Date: 4/9/97

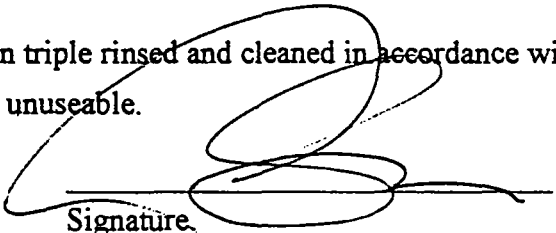
Report Generated

CERTIFICATE OF DECONTAMINATION

It is hereby certified that the following Storage Tanks have been decontaminated by PWC
Pensacola AST/UST Storage System Tank Team:

BLDG 300
NAVAL SURFACE WARFARE CENTER,
COASTAL SYSTEM STATION
PANAMA CITY, FLORIDA

The Storage Tanks listed above have been triple rinsed and cleaned in accordance with
40 CFR 261.7(b)(3)(i) and have been rendered unuseable.



Signature

Paul R Semmes, PE
Environmental Engineer
Title

4/8/97
Date

APPENDIX D

FUEL SPILL INVESTIGATION REPORT



DEPARTMENT OF THE NAVY
NAVY EXPERIMENTAL DIVING UNIT
321 BULLFINCH ROAD
PANAMA CITY, FLORIDA 32407-7015

A14

5102
Ser 01/ 444
31 Oct 96

IN REPLY REFER TO:

From: Commanding Officer, Navy Experimental Diving Unit
To: Safety and Environmental Office, Coastal Systems Station, Panama City

Subj: FUEL SPILL INVESTIGATION SUMMARY

Encl: (1) Summary of the Command Investigation of the Building 300 Fuel Spill of
7 Sep 96

1. Enclosure (1) is forwarded as requested.


J. R. WILKINS III

**Summary of the Command Investigation of the Building 300 Fuel Spill of
7 September 96**

Attachment: Southern Earth Sciences Soil Core Sample Data Sheets

The following is a summary of the Command Investigation which determined the cause and estimated the extent of a diesel fuel spill that occurred 07 September 96 outside the NEDU Ocean Simulation Facility (OSF), Building 300. The extent of the spill was estimated using Emergency Diesel Generator (EDG) Operation Logs and fuel consumption data from the EDG manufacturer.

Findings of Fact

On 7 September 96, a Navy sailor standing watch at NEDU started the EDG day tank refueling pump in the manual mode. The tank has a float level that indicates the fuel level. The sailor left the pump running unattended for approximately one hour, and the day tank was filled beyond capacity...

While the day tank is equipped with a piping system that returns excess fuel to the source tank, because that piping is the same internal diameter as the supply piping, it could not accommodate the seven gallon per minute delivery rate of the EDG day tank fuel pump. As a result, fuel was displaced into the day tank vent pipe, which extends outside the OSF, at the Southwest corner the building, approximately 10 feet above the top of the day tank. Eventually, fuel reached the end of the vent pipe, spilling to the ground at the Southwest corner of the OSF.

During a security check approximately one hour after leaving the pump unattended, the sailor discovered a diesel fuel spill on the floor in the OSF machinery spaces, at the base of the day tank. Realizing he'd left the pump running, he immediately shut it off. The spill was less than two quarts, and the sailor immediately took affirmative steps to clean it up, using a mop and absorbent pads. At that time, he was not aware that the spill had occurred outside the OSF.

The outside spill was discovered on 16 Sep 96, by a Florida State inspector, who was at NEDU to inspect an unused underground fuel tank that was being removed, and noticed the smell at the site of the spill. A crew was assigned to excavate the area of the spill, in an attempt to remove all fuel contaminated-soil. Soil was removed to about four feet below the surface, placed in a large dumpster, and covered with plastic sheeting until it could be properly disposed.

Subsequently, NEDU commissioned Southern Earth Science Co., Panama City, FL, to characterize the impact of the spill on the soil surrounding the OSF; the results of that study were provided to NEDU 20 Sep 96. Soil core samples were taken in the immediate area of the spill, and along the walls extending from the corner (see

Enclosure (1)

enclosure). These samples strongly suggest a long history of repeated diesel fuel spills in the vicinity from other sources, as high concentrations of diesel fuel were found 10 feet deep, as far as approximately 8 feet from the corner along the South wall, and 24 feet from the corner along the West wall.

The outside diesel fuel tank has a capacity of 750 gallons. The last time it was filled prior to this incident was on 28 Mar 96. Since then, the EDG had been run a total of approximately 34.1 hours. The published EDG fuel consumption rates were used to characterize fuel consumption, based on the average electrical load the EDG was sustaining during each recording period. Based on this analysis, approximately 522 gallons had been consumed by running the EDG since 28 Mar 96.

On 24 Sep 96, the outside EDG tank was refilled, taking 654 gallons to fill it to capacity, suggesting the outside tank still held approximately 95 gallons of fuel. This accounts for a total of approximately 617 gallons of diesel fuel, leaving approximately 132 gallons unaccounted for, and presumed spilled outside the OSF in the vicinity of the vent pipe during this incident.

FIELD OVA DATA

SITE NEU

JOB NO.

DATE 9-20-96

TEST.

BORING DEPTH
(FEET)

SOIL
CLASSIFICATION

W/O
FILTER
(PPM)

WITH
FILTER
(PPM)

CORR.
READING
(PPM)

4' cut	B-1	4'	Bottom	-	100.0	1.0	99.0	odor
		7'		-	860.0	200.0	660.0	st odor
		10'		-	>1000	800.0	>200.0	odor
		13'		-	>1000	>1000.0	?	odor
2' cut	B-2	2'	Bottom		24.0	0	24.0	sl odor
		5'			5.4	0	5.4	sl odor
		7'			5.8	0	5.8	sl odor
		10'			920.0	900.0	20.0	sl odor
		18'			>1000	>1000.0		sl odor
	B-3	1'	East Wall		3.0	0	3.0	no odor?
	B-4	1'	South Wall		32.0	3.0	29.0	sl odor
	B-5	3'	South Wall		3.0	0	3.0	sl odor
	A-1	2'	West Wall		10.0	0	10.0	odor

FIELD OVA DATA

SITE NEDU

JOB NO.

DATE 9-20-96

TECH.

BORING DEPTH
(FEET)

SOIL
CLASSIFICATION

W/O
FILTER
(PPM)

WITH
FILTER
(PPM)

CORR.
READING
(PPM)

B-8	6" IN	North Wall	7.0	Ø	7.0	Sl odor
	3' IN	North Wall	1.0	Ø	1.0	
B-9	3'		1.0	Ø	1.0	
	6.5'		Ø			
	10'		71000.0	71000.0	?	Sl odor
B-10	3'		90.0	10.0	80.0	odor
	7'		22.0	Ø	22.0	Sl odor
	8'		100.0	Ø	100.0	odor
B-11	1'		50	Ø	50	NO odor
	3'		Ø		Ø	
	7'		Ø		Ø	
	9'		Ø		Ø	
B-12	1'		1.0	Ø	1.0	
	3'		Ø		Ø	
	Ø	BY Bubble				

FIELD OVA DATA

SITE NEDV

JOB NO.

DATE 7-2-96

TECH.

BORING DEPTH
(FEET)SOIL
CLASSIFICATIONW/O
FILTER
(PPM)WITH
FILTER
(PPM)CORR.
READING
(PPM)

* B-13	1		.2	Ø	.2	
	3'		340.0	200.0	320.0	Sl odor
	7'		>1000.0	300.0	>200.0	St odor
* X	10'		>1000.0	500.0	>500.0	St odor
B-14	1		.1	Ø	.1	No odor
	3'		120.0	Ø	120.0	Sl odor
	7'		760.0	220.0	540.0	St odor
* X	10'		>1000.0	>1000		Strong odor
B-15	8		Ø		Ø	
	8		7.0	Ø	7.0	Sl odor
	7		280.0	50.0	230.0	St odor
	10		>1000.0	>1000.0	—	St odor
B-16	1		Ø		Ø	
	3		Ø		Ø	
	7		Ø		Ø	
	90		Ø		Ø	
B						

FIELD OFA DATA

SITE NEON

JOB NO.

DATE 9-20-76

॥३॥

BORING DEPTH
= (FEET)

SOIL CLASSIFICATION

W/O
FILTER
(PPM)

WITH
FILTER
(PPH)

CORR.
READING
(PEM)

B-17	11		0		0
	31		0		0
	71		0		0
	91		.3	0	.3 no color
Mike Cross					
List Kel					

APPENDIX E

SOIL BORING LOGS

See Boring location Figure

PROJECT:		BORING NO.: 5801	
CTO 0027		TOTAL DEPTH: 12'	
JOB NO.: 7540		LOGGED BY: G. Goode	
PROJ. MGR: Paul Celligon		EDITED BY:	
DRILLING CONTRACTOR: TEG			
DRILL RIG TYPE: Strata probe Unit			
DRILLERS NAME: Jason Angolin			
SAMPLING METHODS: Split spoon			
DRILLING TECHNIQUE: Direct Push			
HAMMER WT: NA		OROP: —	
STARTED TIME: 11:25		DATE: 3/18/97	
COMPLETED TIME: 12:10		DATE: 3/18/97	
BORING DEPTH (R): 12'		BOREHOLE DIA.: 2 1/4"	
CASING DEPTH (R): NA			
WATER DEPTH (R): @ 8'			
TIME:			
DATE:			
BACKFILLED TIME: 12:10		DATE: 3/18/97	
TOP OF CASING ELEV.: —		BY: —	
AMOUNT OF FREE PRODUCT: —		DATUM:	
RISE/FALL OF WATER TABLE: —		TIME INTERVAL:	

[illegible]

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS OR AS IN CODE	PROJECT: <u>CTD 0027</u>	NO. <u>7540</u>	BORING NO. <u>SB01</u>
10-11	<i>Blind</i>	<i>NA</i>	<i>↑</i>	<i>NA</i>	<i>5-6%</i>	<i>20-25</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	1	<i>SP</i>	LITHOLOGIC DESCRIPTION: <i>Sand, light gray, very fine to fine grained, little fines, saturated</i>		
11-12	<i>Blind</i>	<i>↓</i>	<i>↓</i>	<i>↓</i>			<i>NA</i>	<i>NA</i>	<i>NA</i>	2	<i>F.A.B.</i>			
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

See Boring Location Figure

PROJECT: CTO 0027	BORING NO.: SB02
JOB NO.: 7540	TOTAL DEPTH: 12'
PROJ. MGR: Paul Calligan	LOGGED BY: G. Goode
DRILLING CONTRACTOR: TEG	EDITED BY:
DRILL RIG TYPE: Stataprobe	
DRILLERS NAME: Jason Angolin	
SAMPLING METHODS: Split Spoon	
DRILLING TECHNIQUE: Direct Push	
HAMMER WT: NA	DROP: —
STARTED TIME: 12:30	DATE: 3/18/97
COMPLETED TIME: 13:30	DATE: 3/18/97
BORING DEPTH (ft): 12'	BOREHOLE DIA.: 2 1/4"
CASING DEPTH (ft): NA	
WATER DEPTH (ft): @ 8'	
TIME:	
DATE:	
BACKFILLED TIME: 13:30	DATE: 3/18/97 BY: TEG
TOP OF CASING ELEV.: —	DATUM: —
AMOUNT OF FREE PRODUCT: —	
RISE/FALL OF WATER TABLE: —	TIME INTERVAL: —

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE
0-1	SS	NA	↑	12		None	ND	-	ND	0	
1-2	↓		↓	12	Dry		ND	-	ND	1	SP
2-3	↑		↑	12						2	
3-4	SS		↑	12	Dry		ND	-	ND	3	
4-5	↑		↑	12						4	SP
5-6	SS		↑	12						5	
6-7	↓		↓	12	Dry		ND	-	ND	6	
7-8	↑		↑	12						7	SP
8-9	SS		↑	12	moist		ND	-	ND	8	
9-10	↓		↓	12	Saturated		NA	NA	NA	9	
										10	

LITHOLOGIC DESCRIPTION:
Sand, light gray, fine grained, occasional spots of dark organic matter, little fines, dry
Sand, white, fine grained, very clean, no fines, dry
Sand, yellowish orange, fine to medium grained, some non plastic fines, dry
Sand, light brown very fine to fine grained, little fines, moist

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS OR	ASTM CODE	PROJECT: <u>C70 0027</u>	NO. <u>7540</u>	BORING NO. <u>SB02</u>
10-11	Q _u 4	NA	→	NA	Saturated	none	NA	NA	NA	1	SP		LITHOLOGIC DESCRIPTION: Sand, light gray, very fine to fine grained, little fines, Saturated		
11-12	Q _u 4	↓	→	↓	Saturated	↓	NA	NA	NA	2	E.O.B.				
										3					
										4					
										5					
										6					
										7					
										8					
										9					
										0					
										1					
										2					
										3					
										4					
										5					
										6					
										7					
										8					
										9					
										0					

See Boring location Figure

PROJECT: CTO 0027	BORING NO.: SB03
JOB NO.: 7540	TOTAL DEPTH: 12'
PROJ. MGR: Paul Callison	LOGGED BY: G. Goode
DRILLING CONTRACTOR: TEG	EDITED BY:
DRILL RIG TYPE: Stratoprobe	
DRILLERS NAME: Jason Angolin	
SAMPLING METHODS: Split Spoon	
DRILLING TECHNIQUE: Direct Push	
HAMMER WT: 14.20 NA	DROP: -
STARTED TIME: 14:20	DATE: 3/18/97
COMPLETED TIME: 14:50	DATE: 3/18/97
BORING DEPTH (R): 12'	BOREHOLE DIA.: 2 1/4"
CASING DEPTH (R): NA	
WATER DEPTH (R): @ 8'	
TIME:	
DATE:	
BACKFILLED TIME: 14:50	DATE: 3/18/97 BY: TEG
TOP OF CASING ELEV.: -	DATUM: -
AMOUNT OF FREE PRODUCT: -	
RISE/FALL OF WATER TABLE: -	TIME INTERVAL: -

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE
0-1	↑ SS	NA	↑ 24	12	Dry	none	ND	-	ND	0	
1-2	↓	↓	↓	12	↓	↓	ND	-	ND	1	SP
2-3										2	
3-4										3	
4-5										4	
5-6	↑ SS	NA	↑ 24	12	Dry	none	ND	-	ND	5	
6-7	↓	↓	↓	12	↓	↓	ND	-	ND	6	SP
7-8										7	
8-9										8	
9-10										9	
										10	

LITHOLOGIC DESCRIPTION:

Sand, light brown to yellowish orange,
fine grained, trace of organics, no fines
dry

Sand light gray, fine grained, little to
no fines, dry

Sand, light gray, fine grained, little to
no fines, some organic matter and roots,
dry

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT: <u>CTO 002</u>	NO. <u>7540</u>	BORING NO. <u>SB03</u>
10-11	SS	NA	12"	12"	5.5%	NA	NA	NA	NA	1	SP	Soil light gray very fine to fine grained sand, little fins, saturated		
11-12	↓		24	12"		↓	NA	NA	NA	2	F.O.B.			
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION, GRAIN SIZE, COLOR, ANGULARITY, DENSITY/CONSISTANCY

See Boring Location Figure

PROJECT: CTO 0027	BORING NO.: SB04
JOB NO.: 7540	TOTAL DEPTH: 12'
PROJ. MGR: Paul Calligan	LOGGED BY: G. Goode
DRILLING CONTRACTOR: TEG	EDITED BY:
DRILL RIG TYPE: Strataprobe	
DRILLERS NAME: Jason Angolin	
SAMPLING METHODS: Split Spoon	
DRILLING TECHNIQUE: Direct Push	
HAMMER WT: NA	DROP: -
STARTED TIME: 15:10	DATE: 3/18/97
COMPLETED TIME: 16:05	DATE: 3/18/97
BORING DEPTH (ft): 12'	BOREHOLE DIA.: 2 1/4"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE
0-1	↑ SS	NA	↑ 24	12	Dry	NA	ND	-	ND	0	
1-2	↓	↓	↓	12	↓	↓	ND	-	ND	1	SP
2-3										2	
3-4										3	
4-5										4	
5-6	↑ SS	NA	↑	12	Dry	Pinel odor	300	ND	300	5	SP
6-7	↓	↓	↓	12	↓	↓	100	ND	100	6	SP
7-8										7	
8-9										8	
9-10										9	
										10	

LITHOLOGIC DESCRIPTION:

Humus, dark brown, organic rich
 Sand, brown, very fine to fine grained, low
 plastic fines, some organics, dry

Sand, greenish gray, fine grained,
 stained with diesel fuel (diesel fuel like
 odor) little fines

Sand, white, very fine grained stained
 greenish gray with diesel fuel (diesel like
 odor) dry

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT: <u>CD0027</u>	NO. <u>7540</u>	BORING NO. <u>5B04</u>
10-11	SS	NA	17	12	Saturated	Slight Diesel	NA	NA	NA	1	SP	Sand, dark gray very fine to fine grained some non plastic fines, slight diesel odor, saturated		
11-12			24	12	Saturated	Slight Diesel	NA	NA	NA	2	faB-			
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION. GRAIN SIZE, COLOR,
ANGULARITY, DENSITY/CONSISTANCY

See Boring location Figure

PROJECT: CTO 0027		BORING NO.: SB05	
JOB NO.: 7540		TOTAL DEPTH: 12'	
PROJ. MGR: Paul Calligon		LOGGED BY: G. Goode	
DRILLING CONTRACTOR: TEG		EDITED BY:	
DRILL RIG TYPE: Stata probe			
DRILLERS NAME: Jason Angolin			
SAMPLING METHOODS: Hand Aug (grab) / solid spoon			
DRILLING TECHNIQUE: Direct Push			
HAMMER WT: NA		DROP: -	
STARTED TIME: 16:10		DATE: 3/18/97	
COMPLETED TIME: 17:35		DATE: 3/18/97	
BORING DEPTH (ft.)		BOREHOLE DIA.:	
12'		2 1/4"	

CASING DEPTH (ft)	NA		
WATER DEPTH (ft)	@ 8'		
TIME:			
DATE:			
BACKFILLED TIME: 17:35		DATE: 3/18/97	BY: TEL
TOP OF CASING ELEV.:		DATUM:	
AMOUNT OF FREE PRODUCT:			
RISE/FALL OF WATER TABLE:		TIME INTERVAL:	

LITHOLOGIC DESCRIPTION :

Humas, dark brown, organic rich
Sand, brown, very fine to fine grained,
some non plastic fines, with organic
matter, dry

Sand, light gray, fine grained, little to
no fines (diesel like odor), dry

[illegible]

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT: 6700027	NO. 755D	BORING NO. 5805
10-11	SS	NA	↑	12	Saturated	Pinch odor	NA	NA	NA	1	SP	Soil, dark gray very fine to fine grained, some non plastic fines, light diesel odor, Saturated		
11-12	↓	↓	↓	12	Saturated	Pinch odor	↓	↓	↓	2	E.O.B.			
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION, GRAIN SIZE, COLOR,
ANGULARITY, DENSITY/CONSISTANCY

See Boring location Figure

PROJECT: CTO 0027		BORING NO.: SB06	
		TOTAL DEPTH: 12'	
JOB NO.: 7540		LOGGED BY: G. Goode	
PROJ. MGR: Paul Callison		EDITED BY:	
DRILLING CONTRACTOR: TEG			
DRILL RIG TYPE: Strata probe			
DRILLERS NAME: Jason Angolin			
SAMPLING METHODS: Hand Auger (grab) Split Spoon			
DRILLING TECHNIQUE: Direct Push			
HAMMER WT: NA		DROP: -	
STARTED TIME: 7:25		DATE: 3/19/97	
COMPLETED TIME: 8:15		DATE: 3/19/97	
BORING DEPTH (ft): 12'		BOREHOLE DIA.: 2 1/4"	

CASING DEPTH (ft)	NA		
WATER DEPTH (ft)	8'		
TIME:			
DATE:			
BACKFILLED TIME: 8:15	DATE: 3/17/57	BY: TEL	
TOP OF CASING ELEV.: —	DATUM: —		
AMOUNT OF FREE PRODUCT: —			
RISE/FALL OF WATER TABLE: —		TIME INTERVAL: —	

LITHOLOGIC DESCRIPTION :

Humus, dark brown, organic matter
Sand, light gray, very fine to fine grained
little to no fines, occasional root
fragments, dry

Sand, light gray, very fine to fine grained
some non plastic fines, dry

Sand as above with roots and organic
matter

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT: C70 007	NO. 7546	BORING NO. 8806
10-11	SS	NA	↑	12	Saturated	None	NA	NA	NA	1	EAB	Sand light gray, very fine to fine grained, non plastic fines, saturated		
11-12	↓	↓	↓	12	Saturated	↓	↓	↓	↓	2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION, GRAIN SIZE, COLOR, ANGULARITY, DENSITY/CONSISTANCY

See Boring Location Figure

PROJECT: CTO 0027		BORING NO.: 5807	
		TOTAL DEPTH: 14'	
JOB NO.: 7540		LOGGED BY: G Goode	
PROJ. MGR: Paul Collison		EDITED BY:	
DRILLING CONTRACTOR: TEG			
DRILL RIG TYPE: Power Wagon			
DRILLERS NAME: Jason Angolin			
SAMPLING METHODS: Hand Auger (Grab) Split Spoon			
DRILLING TECHNIQUE: Hand Auger & Direct Push			
HAMMER WT: NA		DROP: -	
STARTED TIME: 8:40		DATE: 3/19/97	
COMPLETED TIME: 12:00		DATE: 3/21/97	
BORING DEPTH (ft) 14'		BOREHOLE DIA.: 3"	

CASING DEPTH (ft)	NA		
WATER DEPTH (ft)	28'		
TIME:			
DATE:			
BACKFILLED TIME:	Converted to well location		
	DATE:		BY:
TOP OF CASING ELEV.: 10.44	DATUM: Arbitrary		
AMOUNT OF FREE PRODUCT:	—		
RISE/FALL OF WATER TABLE:	—		
	TIME INTERVAL:	—	

LITHOLOGIC DESCRIPTION:

Sand, light gray, very fine to fine grained,
little to no fines, dry

Sand, white, very fine to fine grained,
very clean, no fines, dry

Sand, light gray, very fine to fine
grained, little to no fines, dry

[illegible]

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS OR	ASIM CODE	PROJECT: CTO 0027	NO. 7540	BORING NO. 5807
10-11	HA	NA	NA	NA	50% Saturated	None	NA	NA	NA	1	X	4	LITHOLOGIC DESCRIPTION: Sand, light gray, very fine to fine grained, some non plastic fines, Saturated		
11-12	↓	↓	↓	↓	50% Saturated	↓	↓	↓	↓	2	X				
12-13	↑	NA	↑	12	50% Saturated	None	NA	NA	NA	3					
13-14	SS	↓	24	12	50% Saturated	↓	↓	↓	↓	4		E.O.B.			
										5					
										6					
										7					
										8					
										9					
										0					
										1					
										2					
										3					
										4					
										5					
										6					
										7					
										8					
										9					
										0					

PZ - 2

See Boring location Figure

PROJECT:

CTD 0027

BOHRING NO.: 5808

TOTAL DEPTH: 14'

JOB NO.: 7540

LOGGED BY: G. Gooder

PROJ. MGR: Paul Collins

EDITED BY:

DRILLING CONTRACTOR: TEG

DRILL RIG TYPE: Strataprobe

DRILLERS NAME: Jason Angelin

SAMPLING METHODS: split 50g

DRILLING TECHNIQUE: *Direct Push*

HAMMER WT:

NA

DROP: -

STARTED TIME:

13:15

DATE: 3/19/97

COMPLETED TIME:

DATE:

BORING DEPTH (ft)

14

BOREHOLE DIA.:

 $2\frac{1}{4}''$ [illegible]

NA

WATER DEPTH (R)

98

TIME:

DATE:

BACKFILLED TIME: (Converted to well location) DATE: BY:

TOP OF CASING ELEV.: 10.00

DATE: 4/1/20

AMOUNT OF FREE PRODUCT :

RISE/FALL OF WATER TABLE :

TIME INTERVAL: —

LITHOLOGIC DESCRIPTION :

Sand, light grey, fine grained, some organic roots, no fines, dry

Sand, light gray, very fine to fine grained,
some non plastic fines, dry

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT: (T0007)	NO. 7540	BORING NO. 5808
10-11	↑	NA	↑	12	Sealed	NND	NA	NA	NA	1	SP	Soil: light gray, gray, fine to fine grained, fines of low plasticity, saturated		
11-12	SS ↓		24	12	Sealed					2				
12-13	↑		24	12						3				
13-14	SS ↓		24	12						4	ε.ab			
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION, GRAIN SIZE, COLOR, ANGULARITY, DENSITY/CONSISTANCY

See Boring Location Figure

PROJECT: CTO 0027	BORING NO.: 5809
JOB NO.: 7540	TOTAL DEPTH: 12'
PROJ. MGR: Paul Celligson	LOGGED BY: G. Goode
DRILLING CONTRACTOR: TEG	EDITED BY:
DRILL RIG TYPE: NA	
DRILLERS NAME: Jason Angelin	
SAMPLING METHODS: Grab	
DRILLING TECHNIQUE: Hand Auger	
HAMMER WT: NA	DROP: -
STARTED TIME: 15:15	DATE: 3/19/97
COMPLETED TIME: 16:00	DATE: 3/19/97
BORING DEPTH (ft): 12'	BOREHOLE DIA.: 3"
CASING DEPTH (ft): NA	
WATER DEPTH (ft): @ 8'	
TIME:	
DATE:	
BACKFILLED TIME: 16:00	DATE: 3/19/97 BY: TEG
TOP OF CASING ELEV.: -	DATUM: -
AMOUNT OF FREE PRODUCT: -	
RISE/FALL OF WATER TABLE: -	TIME INTERVAL:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	LITHOLOGIC DESCRIPTION:
0-1										0		
1-2										1		
2-3										2		
3-4										3		
4-5										4		
5-6	HA	NA	NA	NA	Dry	dry	40	ND	40	5	SP	Sand, light to dark gray, very fine to fine grained, (diesel like odor with greenish/yellowish stains (diesel) non plastic fines, dry
6-7					Dry		100	ND	100	6		
7-8					Moist		NA	NA	NA	7		
8-9					Saturated					8		
9-10										9		
										10		

Open Trench

Sand, light to dark gray, very fine to fine grained, (diesel like odor with greenish/yellowish stains (diesel) non plastic fines, dry

Sand, as above, Saturated at @ 8'

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS OR	ASTM CODE	PROJECT: CTO 0027	NO. 7540	BORING NO. 5809
10-11	HA	VA	NA	NA	Saturated	Discolored	NA	NA	NA	1			LITHOLOGIC DESCRIPTION : Sand, dark gray, very fine to fine grained. some non plastic fines, Saturated		
11-12	↓	↓	↓	↓	↓	↓	↓	↓	↓	2	EaB.				
										3					
										4					
										5					
										6					
										7					
										8					
										9					
										0					
										1					
										2					
										3					
										4					
										5					
										6					
										7					
										8					
										9					
										0					

PROJECT: CTO 0037		BORING NO.: 5810	
		TOTAL DEPTH: 14'	
JOB NO.: 7540		LOGGED BY: G. Goode	
PROJ. MGR: Paul Callison		EDITED BY:	
DRILLING CONTRACTOR: TEG			
DRILL RIG TYPE: Stretch probe			
DRILLERS NAME: Jason Angelin			
SAMPLING METHODS: Split Spoon			
DRILLING TECHNIQUE: Direct Push			
HAMMER WT: 14		DROP: —	
STARTED TIME: 16:15		DATE: 3/19/97	
COMPLETED TIME: 12:00		DATE: 3/21/97	
BORING DEPTH (ft)		BOREHOLE DIA.:	
14'		2 1/4"	

See Boring location Figure

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	CASING DEPTH (ft)	WATER DEPTH (ft)	TIME:	DATE:	BACKFILLED TIME: (Converted to well)	DATE:	BY:	TOP OF CASING ELEV.: 10.17	DATUM: Arbitrary	AMOUNT OF FREE PRODUCT:	RISE/FALL OF WATER TABLE:	TIME INTERVAL:
0-1	↑	NA	↑	12	Dry	None	ND	-	ND	0	SP	LITHOLOGIC DESCRIPTION:											
1-2	↓	↓	24	12	Dry	None	ND	-	ND	1		Sand, dark brown, very fine to fine grained, little or no fines, organic silt fragments, dry											
2-3										2		Sand, light gray, fine grained, no fines, dry											
3-4										3													
4-5										4													
5-6	↑	NA	↑	12	Dry	None	ND	-	ND	5													
6-7	↓	↓	24	12	Dry	None	ND	-	ND	6		SP	Sand yellowish orange, fine grained, little or no fines, dry										
7-8										7													
8-9										8													
9-10										9													
										10													

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT: Cto 00 27	NO. 7540	BORING NO. SB10
10-11	↑ SS	NA	↑	12	Saturated	naap	NA	NA	NA	1		Sand, light gray, very fine grained, little fines, Saturated		
11-12	↓		↑	12						2				
12-13	↑ SS		↑	12	Saturated					3				
13-14	↓		↓	12						4	E.O.R.	Sand, dark brown, with black bands approx 1/2 inch thick, some non plastic fines, Saturated		
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION. GRAIN SIZE, COLOR, ANGULARITY, DENSITY/CONSISTANCY

See Boring howlin Figure

PROJECT:	BORING NO.:	
CTO 0027	SB11	
JOB NO.:	TOTAL DEPTH:	
7540	12'	
PROJ. MGR:	LOGGED BY:	
Paul Colligan		
DRILLING CONTRACTOR:	EDITED BY:	
TEG		
DRILL RIG TYPE:		
Strata probe		
DRILLERS NAME:		
Jason Angolin		
SAMPLING METHODS:		
Sol. it Spoon		
DRILLING TECHNIQUE:		
Direct Push		
HAMMER WT:	DROP:	
NA	-	
STARTED TIME:	DATE:	
7:25	3/20/97	
COMPLETED TIME:	DATE:	
8:10	3/20/97	
BORING DEPTH (ft.)	BOREHOLE DIA.:	
12'		2 1/4"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	CASING DEPTH (ft)	WATER DEPTH (ft)	TIME:	DATE:	BACKFILLED TIME:	DATE:	BY:	TOP OF CASING ELEV.:	DATUM:	AMOUNT OF FREE PRODUCT:	RISE/FALL OF WATER TABLE:	TIME INTERVAL:	
0-1	↑ SS	NA	↑ 24	12	Dry	None	ND	-	ND	0	SP													
1-2	↓	↓	↓ 24	12	Dry	None	ND	-	ND	1														
2-3										2														
3-4										3														
4-5										4														
5-6	↑ SS	NA	↑ 24	12	Dry	None	ND	-	ND	5														
6-7	↓	↓	↓ 24	12	Dry	None	ND	-	ND	6														
7-8										7														
8-9										8														
9-10										9														
										10														

LITHOLOGIC DESCRIPTION :

 Sand, light gray, fine grained, no fines, dry

Sand, yellowish orange fine grained, no fines, dry

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT <u>CTD 0027</u>	NO. <u>7570</u>	BORING NO. <u>SB11</u>
10-11	↑ SS	NA	↑ 12	12	Subsided	NA	NA	NA	NA	1		Sand, light gray, very fine to fine grained 1.44% fines (non-plastic) substandard		
11-12	↓	NA	↓ 24	12	Subsided	NA	NA	NA	NA	2	E.O.R.	Sand, dark brown with black bands, very fine to fine grained substandard		
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION, GRAIN SIZE, COLOR,
ANGULARITY, DENSITY/CONSISTANCY

See Boring location Figure

PROJECT: CTO 0027	BORING NO.: SB12
JOB NO.: 7540	TOTAL DEPTH: 12'
PROJ. MGR: Paul Calligan	LOGGED BY: G. Goode
DRILLING CONTRACTOR: TEG	EDITED BY:
DRILL RIG TYPE: Hand Auger	
DRILLERS NAME: Jason Anglin	
SAMPLING METHODS: Grab	
DRILLING TECHNIQUE: Hand Auger	
HAMMER WT: NA	DROP: -
STARTED TIME: 8:40	DATE: 3/20/97
COMPLETED TIME: 8:55	DATE: 3/20/97
BORING DEPTH (ft): 12'	BOREHOLE DIA.: 3"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	
0-1										0		
1-2										1		
2-3										2		
3-4										3		
4-5										4		
5-6	HA	NA	NA	NA	Dry	None	ND	-	ND	5		
6-7					Dry	None	ND	-	ND	6	SP	
7-8					moist		ND	-	ND	7		
8-9					Saturated	like	NA	NA	NA	8		
9-10					diff. odor					9		
										10		

CASING DEPTH (ft)	NA		
WATER DEPTH (ft)	28'		
TIME:			
DATE:			
BACKFILLED TIME: 8:55	DATE: 3/20/97	BY: TEG	
TOP OF CASING ELEV.:		DATUM:	
AMOUNT OF FREE PRODUCT:			
RISE/FALL OF WATER TABLE:		TIME INTERVAL:	

LITHOLOGIC DESCRIPTION:

Open Trench

Sand, light gray, very fine to fine grained, no fines, dry

Sand (as above)

Sand, as above, Sch. 100

See Boring location Figure

PROJECT: CTD 0027	BORING NO.: SB13
JOB NO.: 7540	TOTAL DEPTH: 12'
PROJ. MGR: Paul Collegen	LOGGED BY: G. Goode
DRILLING CONTRACTOR: TEG	EDITED BY:
DRILL RIG TYPE: Hand Auger	
DRILLERS NAME: Jason Angolia	
SAMPLING METHODS: Hand Auger (Grab)	
DRILLING TECHNIQUE: Hand Auger	
HAMMER WT: NA	DROP: -
STARTED TIME: 9:00	DATE: 3/20/97
COMPLETED TIME: 9:20	DATE: 3/20/97
BORING DEPTH (ft): 12'	BOREHOLE DIA.: 3"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE
0-1	HA	NA	NR	NA	Dry	None	ND	-	ND	0	SP
1-2	HA	NA	NA	NA	Dry	None	ND	-	ND	1	
2-3							NA	NA	NA	2	
3-4										3	
4-5										4	
5-6	HA	NA	NA	NA	PM	None	ND	-	ND	5	
6-7					PM		ND	-	ND	6	
7-8					moist		ND	-	ND	7	
8-9	HA	NA	NA	NA	moist	None	NA	NA	NA	8	
9-10					moist					9	
										10	

LITHOLOGIC DESCRIPTION:

Sand light gray, very fine to fine grained, no fines dry

Sand light gray, very fine to fine grained, some non plastic fines, dry

Moist at 8'

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS OR	ASTM CODE	PROJECT: CTO 0027	NO. 7540	SB13 BORING NO.
10-11	HA	NA	NA	NA	NA	NA	NA	NA	NA	1			LITHOLOGIC DESCRIPTION : Sand, light gray, fine grained Saturated		
11-12	↓	↓	↓	↓	↓	↓	↓	↓	↓	2					
										3					
										4					
										5					
										6					
										7					
										8					
										9					
										0					
										1					
										2					
										3					
										4					
										5					
										6					
										7					
										8					
										9					
										0					

See Boring Location Figure

PROJECT: CTO 0027	BORING NO.: 5814
JOB NO.: 7540	TOTAL DEPTH: 12'
PROJ. MGR: Paul Colligan	LOGGED BY: G. Goode
DRILLING CONTRACTOR: TEG	EDITED BY:
DRILL RIG TYPE: Hand Auger	
DRILLERS NAME: Jason Angelin	
SAMPLING METHODS: Grab	
DRILLING TECHNIQUE: Hand Auger	
HAMMER WT: NA	DROP: -
STARTED TIME: 9:20	DATE: 3/20/97
COMPLETED TIME: 9:45	DATE: 3/20/97
BORING DEPTH (ft): 12'	BOREHOLE DIA.: 3"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE
0-1	HA	NA	NA	NA	Dry	None	ND	-	ND	0	
1-2	HA	NA	NA	NA	Dry	None	ND	-	ND	1	
2-3							NA	NA	NA	2	
3-4										3	
4-5										4	
5-6	HA	NA	NA	NA	Dry	None	ND	-	ND	5	
6-7					Dry	None	ND	-	ND	6	
7-8					moist	None	ND	-	ND	7	
8-9	HA	NA	NA	NA	Saturated	None	NA	NA	NA	8	
9-10										9	
										10	

LITHOLOGIC DESCRIPTION:

Sand, light brown, very fine to fine grained, no fines, dry

Sand, yellowish orange, very fine to fine grained some non plastic fines, dry

Sand, light brown, very fine to fine grained, no fines, dry

Moist.



See Boring location Figure

PROJECT:	BORING NO.: 5815	
CTD 0027	TOTAL DEPTH: 12'	
JOB NO.: 7540	LOGGED BY: G. Goode	
PROJ. MGR: Paul Colligon	EDITED BY:	
DRILLING CONTRACTOR: TEG		
DRILL RIG TYPE: Stratoprobe		
DRILLERS NAME:		
SAMPLING METHOOOS: Split spoon		
DRILLING TECHNIQUE: Direct Push		
HAMMER WT: 11.4	DROP: -	
STARTED TIME: 16:00	DATE: 3/20/97	
COMPLETED TIME: 18:45	DATE: 3/20/97	
BORING DEPTH (ft)	12'	BOREHOLE DIA.: 2 1/4"

CASING DEPTH (R.)	NA		
WATER DEPTH (R.)	28'		
TIME:			
DATE:			
BACKFILLED TIME: 16:45		DATE: 3/20/97	BY: TEB
TOP OF CASING ELEV.: —	DATUM: —		
AMOUNT OF FREE PRODUCT: —			
RISE/FALL OF WATER TABLE: —	TIME INTERVAL: —		

LITHOLOGIC DESCRIPTION :

Sand, dark brown, very fine to fine grained, organic and root fragments, dry

Sand, yellowish orange, very fine to fine grained, no fines, dry

Sand, light brown, fine grained, little to no fines, dry

Sand, white, very fine grained, some non plastic fines, moist

2nd, as above, Sabrina had

DEPTH		TYPE	BLOWS	DRIVEN	REC'VD	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT
11		NA	NA	NA	NA	5.0.8	1	1	1	1
12										
13										
14										
15										
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
0										

USCS OR ASTM CODE	LITHOLOGIC DESCRIPTION :
PROJECT: CTD 0027	E.O.B
NO. 7540	
P14-300-	
BORING NO. 44.1	

PCY-300-

See Boring Location Figure

PROJECT: CTO 0027
 BORING NO.: MWO 2
 TOTAL DEPTH: 15.5'
 JOB NO.: 7540
 LOGGED BY: G. Goode
 PROJ. MGR: Paul Celligan
 EDITED BY:
 DRILLING CONTRACTOR: Gulf Atlantic Drilling
 DRILL RIG TYPE: RAM 10 (Deep Rock)
 DRILLERS NAME: William Lindsey
 SAMPLING METHODS: Blind Drilled To Completion
 DRILLING TECHNIQUE: Hollow Stem Auger 4 1/4" ID
 HAMMER WT: NA
 DROP: —
 STARTED TIME: DATE: 4/22/97
 COMPLETED TIME: DATE:
 BORING DEPTH (R): 15.5' BOREHOLE DIA.: 8"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/G IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE
HA	-	NA	NA	NA	-	mod	1			0	
HA	-				-					1	
HA	Grab				dry		ND	-	ND	2	X
HA	-				-					3	X
HA	Grab				dry		ND	-	ND	4	X
HA	-									5	X
HA	Grab				mod		ND	-	ND	6	X
							NA	NA	NA	7	X
Blind Pull					fine sand					8	
										9	
										10	

LITHOLOGIC DESCRIPTION:

0 to 8" Corcrete
 8" to 1' Shell and Fine grained sand
 (fill)

Sand, light gray, Fine to medium grained,
 very clean, dry

Sand, light gray, Fine to medium grained
 dry

Sand, as above moist at 6' 6"

Borehole blind drilled to completion due
 to close proximity to SB14.

Fine grained sand to 15.5' b/s.

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS OR	ASTM CODE	PROJECT: CTU 0027	NO. 7540	BORING NO. 124-300 - 12
1	NA	NA	NA	NA		no	NA	-	EM	11			LITHOLOGIC DESCRIPTION : Dark, D.K (organic rich) Fine grained @ 14' bls. E.O.B		
2										12					
3										13					
4										14					
5										15					
6										16					
7										17					
8										18					
9										19					
10										20					
11										21					
12										22					
13										23					
14										24					
15										25					
16										26					
17										27					
18										28					
19										29					
20										30					
21										31					
22										32					
23										33					
24										34					
25										35					
26										36					
27										37					
28										38					
29										39					
30										40					

P14-300 -

See Boring Location Figure

PROJECT: CTO 0027	BORING NO.: Mw 03
JOB NO.: 7540	TOTAL DEPTH: 15.5'
PROJ. MGR: Paul Colligan	LOGGED BY: G. Gooden
DRILLING CONTRACTOR: Gulf Atlantic Drilling	EDITED BY:
DRILL RIG TYPE: RAM 10 (Deep Rock)	
DRILLERS NAME: William Lindsey	
SAMPLING METHODS: (Blind Drilled to Completion)	
DRILLING TECHNIQUE: Hollow Stem Auger 4 1/2" ID	
HAMMER WT: N/A	DROP: —
STARTED TIME: 12:15	DATE: 4/22/97
COMPLETED TIME:	DATE:
BORING DEPTH (ft.) 15.5'	BOREHOLE DIA.: 8"

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	CASING DEPTH (ft.)	WATER DEPTH (ft.)	TIME:	DATE:	BACKFILLED TIME:	DATE:	BY:	TOP OF CASING ELEV.:	DATUM:	AMOUNT OF FREE PRODUCT:	RISE/FALL OF WATER TABLE:	TIME INTERVAL:	LITHOLOGIC DESCRIPTION:	
0 1/2	NA	NA	NA	NA		moist	—	—	—	0	X	NA	—	—	—										
1 1/2										1	X														
2 1/2					DM					2	V														
3 1/2										3	V														
4 1/2										4	V														
										5	V														
					moist					6	V														
										7	V														
Blind Drill										8	V														
					50%					9	V														
										10	V														

Due to close proximity to ~~SSB01~~ ^{SS} the boring was blind drilled to completion

Auger cuttings indicate fine grained sand to 15' b/s.

Due to close proximity to #8501 the boring was blind drilled to completion

Auger cuttings indicate fine grained sand to 15' b/s.

E.O.B.

See Boring location Figure

PLY-300-MW04

PROJECT: CTD 0027
 BORING NO.: MW04
 TOTAL DEPTH: 15.5'
 JOB NO.: 7540
 LOGGED BY: G. Gonda
 PROJ. MGR: Paul Colligan
 EDITED BY:
 DRILLING CONTRACTOR: Gulf Atlantic Drilling
 DRILL RIG TYPE: RM 10 (Deep Rock)
 DRILLERS NAME: William Lindsay
 SAMPLING METHODS: Blind Drill To Completion
 DRILLING TECHNIQUE: Hollow Stem Auger
 HAMMER WT: NA
 DROP:
 STARTED TIME: 14:30
 DATE: 4/22/97
 COMPLETED TIME:
 DATE:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS OR ASTM CODE	BORING DEPTH (R.)	CASING DEPTH (R.)	WATER DEPTH (R.)	TIME:	DATE:	BACKFILLED TIME:	DATE:	BY:	TOP OF CASING ELEV.:	DATUM:	AMOUNT OF FREE PRODUCT:	RISE/FALL OF WATER TABLE:	TIME INTERVAL:	LITHOLOGIC DESCRIPTION:
NA										0		15.5'	NA	-											
14.2	NA	NA	NA	NA	-	-	NA	-	-	1															
14.2										2															
14.2										3															
14.2										4															
										5															
										6															
										7															
										8															
										9															
										10															

Due to close proximity to SBOZ
 the boring was blind drilled to
 completion.

Auger cuttings indicate fine grained
 sand to 15.5' b/s.

E.O.B

APPENDIX F

HEADSPACE METHODOLOGY FOR DETERMINING SOIL ORGANIC VAPOR CONCENTRATIONS

HEADSPACE METHODOLOGY FOR DETERMINING SOIL ORGANIC VAPOR CONCENTRATION

Soil headspace readings were obtained utilizing the following method which conforms to the requirements of Rule 62-770.200(2), FAC.

Two 16 ounce glass soil jars were half-filled with soil sample (duplicate samples). The soil jars were then sealed utilizing "mason jar" type open top screw on caps with foil in place of the conventional solid jar tops. The soil samples were allowed to equilibrate to ambient temperature which was within the FDEP temperature range.

The samples were tested with a Foxboro Century 128, an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). Prior to each days activities, the OVA was field calibrated with 100 ppm methane in air, in accordance with the manufacturers specifications. Sample testing was performed by inserting the OVA probe through the foil sample cover and recording the highest OVA reading. Following collection of this OVA reading, the OVA was fitted with a granular activated carbon filter probe. The OVA was then used to test the headspace above the duplicate sample. Carbon absorbs petroleum hydrocarbons and thus the filtered reading is assumed to represent naturally occurring organic vapors.

Upon completion of the screening exercise, the carbon filtered result was subtracted from the un-filtered result, to obtain a net petroleum vapor value. In accordance with Rule 17(62)-770.200(2), FAC, and Guidelines for Assessment and Remediation of Petroleum Contaminated Soil (May 1994) corrected headspace levels in excess of 50 ppm is defined as excessively contaminated soil for diesel contaminated soil. Corrected headspace levels in excess of 10 ppm but less than 50 ppm are considered as contaminated, though not excessively contaminated.

APPENDIX G

PRE-BURN SOIL LABORATORY DATA SHEETS

Technical Report for**Brown & Root Environmental**

Site G300 CTO 0027

7540

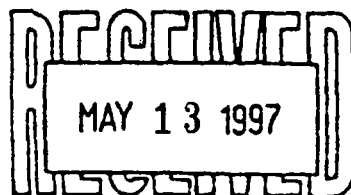
Accutest Job Number: F580

Report to:

C/O Paul Calligan
Brown & Root Environmental
1311 Executive Center Dr. Ste: 220
Tallahassee, FL 32301

ATTN: Arnold Lamb - QA Officer

Total number of pages in report: 10


Harry Benzadi, Ph.D.
Laboratory Director

Results relate only to the items tested.

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.



Sample Summary

Brown & Root Environmental

Date: 05/09/97

Job No: F580

Site G300 CTO 0027

Project No: 7540

Sample Number	Collected		Matrix		Client Sample ID
	Date	Time By	Received	Code Type	
F580-1	04/23/97	13:00 GG	04/25/97	SO Soil	PREABURN SOIL



Report of Analysis

Page 1 of 1

Client Sample ID: PREABURN SOIL
Lab Sample ID: F580-1
Matrix: SO - Soil
Method: EPA 8100
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 92.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01472.D	1	04/28/97	NF	04/28/97	OP85	GLI69
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	360	ug/kg	
208-96-8	Acenaphthylene	ND	360	ug/kg	
120-12-7	Anthracene	ND	360	ug/kg	
56-55-3	Benzo(a)anthracene	ND	360	ug/kg	
50-32-8	Benzo(a)pyrene	ND	360	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	360	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	360	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	360	ug/kg	
218-01-9	Chrysene	ND	360	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	360	ug/kg	
206-44-0	Fluoranthene	ND	360	ug/kg	
86-73-7	Fluorene	ND	360	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	360	ug/kg	
91-20-3	Naphthalene	ND	360	ug/kg	
90-12-0	1-Methylnaphthalene	ND	360	ug/kg	
91-57-6	2-Methylnaphthalene	ND	360	ug/kg	
85-01-8	Phenanthrene	ND	360	ug/kg	
129-00-0	Pyrene	ND	360	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	82%		35-120%
84-15-1	o-Terphenyl	76%		35-120%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: PREABURN SOIL
Lab Sample ID: F580-1
Matrix: SO - Soil
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 92.2

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01581.D	2	05/02/97	NF	05/01/97	OP74	GU73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
---------	----------	--------	-----	-------	---

	TPH (C8-C40)	65.1	18	mg/kg	
--	--------------	------	----	-------	--

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
---------	----------------------	--------	--------	--------

84-15-1	o-Terphenyl	58%		40-140%
---------	-------------	-----	--	---------

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: PREABURN SOIL
Lab Sample ID: F580-1
Matrix: SO - Soil
Method: SW846 8010/8020
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 92.2

Run	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002068.D	1	04/30/97	AW	n/a	n/a	GEF53
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.1	ug/kg	
75-25-2	Bromoform	ND	1.1	ug/kg	
75-27-4	Bromodichloromethane	ND	1.1	ug/kg	
74-83-9	Bromomethane	ND	1.1	ug/kg	
56-23-5	Carbon tetrachloride	ND	1.1	ug/kg	
108-90-7	Chlorobenzene	ND	1.1	ug/kg	
75-00-3	Chloroethane	ND	1.1	ug/kg	
67-66-3	Chloroform	ND	1.1	ug/kg	
74-87-3	Chloromethane	ND	1.1	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.1	ug/kg	
124-48-1	Dibromochloromethane	ND	1.1	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	1.1	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.1	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.1	ug/kg	
75-35-4	1,1-Dichloroethene	ND	1.1	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.1	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.1	ug/kg	
78-87-5	1,2-Dichloropropane	ND	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	1.1	ug/kg	
75-09-2	Methylene chloride	ND	5.5	ug/kg	
1634-04-4	Methyl Tert Butyl Ether	ND	1.1	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.1	ug/kg	
127-18-4	Tetrachloroethene	ND	1.1	ug/kg	
108-88-3	Toluene	ND	1.1	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.1	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.1	ug/kg	
79-01-6	Trichloroethene	ND	1.1	ug/kg	
75-69-4	Trichlorofluoromethane	ND	1.1	ug/kg	
75-01-4	Vinyl chloride	ND	1.1	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.1	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.1	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.1	ug/kg	
1330-20-7	Xylenes (total)	ND	3.3	ug/kg	
156-69-4	cis-1,2-Dichloroethene	ND	1.1	ug/kg	
540-59-0	1,2-Dichloroethene (total)	ND	4.4	ug/kg	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID: PREABURN SOIL
Lab Sample ID: F580-1
Matrix: SO - Soil
Method: SW846 8010/8020
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 92.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002068.D	1	04/30/97	AW	n/a	n/a	GEF53
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	107%		50-150 %

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: PREABURN SOIL
Lab Sample ID: F580-1
Matrix: SO - Soil
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 92.2

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Solids, Percent	92.2		%	1	04/30/97 JK	EPA 160.3 M
Total Organic Halides	<10	10	mg/kg	1	05/06/97 SUB	SW846 9020 M

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 1

Client Sample ID: PREABURN SOIL

Lab Sample ID: F580-1

Matrix: SO - Soil

Project: Site G300 CTO 0027

Date Sampled: 04/23/97

Date Received: 04/25/97

Percent Solids: 92.2

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Arsenic	<0.54	0.54	mg/kg	1	05/01/97	05/05/97 JK	SW846 7060
Barium	<22	22	mg/kg	1	05/01/97	05/05/97 JK	SW846 6010A
Cadmium	<1.1	1.1	mg/kg	1	05/01/97	05/05/97 JK	SW846 6010A
Chromium	<1.1	1.1	mg/kg	1	05/01/97	05/05/97 JK	SW846 6010A
Lead	<54	54	mg/kg	1	04/30/97	05/08/97 JK	SW846 6010A
Mercury	<0.54	0.54	mg/kg	1	05/05/97	05/06/97 JK	SW846 7471A
Selenium	<54	54	mg/kg	1	04/30/97	05/08/97 JK	SW846 6010A
Silver	<1.1	1.1	mg/kg	1	05/01/97	05/05/97 JK	SW846 6010A

RDL = Reported Detection Limit



CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME

ADDRESS

CITY,

STATE

ZIP

SEND REPORT TO:

PHONE #

FACILITY INFORMATION

PROJECT NAME

LOCATION

PROJECT NO.

FAX #

ANALYTICAL INFORMATION

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID

ACCUTEST SAMPLE #

FIELD ID / POINT OF COLLECTION

COLLECTION

DATE

TIME

SAMPLED BY:

MATRIX

OF BOTTLES

PRESERVATION

HCl

NaOH

HNO₃

H₂SO₄

NONE

LAB USE ONLY

DATA TURNAROUND INFORMATION

- ☐ STANDARD
☐ 48 HOUR RUSH
☐ 24 HOUR EMERGENCY
☒ OTHER 1WK

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA
UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- ☐ STANDARD
☒ COMMERCIAL "B"
☐ DISK DELIVERABLE
☐ STATE FORMS
☐ OTHER (SPECIFY) _____

COMMENTS/REMARKS

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:

DATE TIME:

RECEIVED BY:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

RELINQUISHED BY:

DATE TIME:

RECEIVED BY:

SEAL #

PRESERVE WHERE APPLICABLE

ON ICE

TEMPERATURE

C

APPENDIX H

WELL COMPLETION LOGS

ATTACHMENT C-5A
EXAMPLE OVERBURDEN MONITORING WELL SHEET (FLUSHMOUNT)

Site 300

BORING NO.:



MONITORING WELL SHEET

Site 300

PROJECT <u>7540-010-0027</u>	LOCATION <u>Coastal Station</u>	DRILLER <u>William Lindsey</u>
PROJECT NO. <u>7540</u>	BORING <u>PCT-300-4-001</u>	DRILLING METHOD <u>Hydro-Spin Auger 4 1/2"</u>
ELEVATION <u>6/L</u>	DATE <u>4/12/92</u>	DEVELOPMENT METHOD <u>Submersible Pump</u>
FIELD GEOLOGIST <u>John G. Webster</u>		

Ground Elevation _____

Flush mount surface casing with lock

ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: _____

TYPE OF PROTECTIVE CASING: 8 inch man hole - Steel

I.D. OF PROTECTIVE CASING: _____

DIAMETER OF HOLE: 4.25 ID Auger - 8 inch bore hole

TYPE OF RISER PIPE: PVC

RISER PIPE I.D.: 2" 5'

TYPE OF BACKFILL/SEAL: 1/2 inch Bentonite Tablets
6" Sodium Bentonite (CE TCO)

DEPTH/ELEVATION TOP OF SAND: 3'

DEPTH/ELEVATION TOP OF SCREEN: 5'

TYPE OF SCREEN: PVC

SLOT SIZE x LENGTH: .010 x 10'

TYPE OF SAND PACK: 20/30 - 6 bags

DIAMETER OF HOLE IN BEDROCK: 4.25 ID Augers - 8 inch bore hole

DEPTH/ELEVATION BOTTOM OF SCREEN: 15'


DEPTH/ELEVATION BOTTOM OF SAND: 15.5'

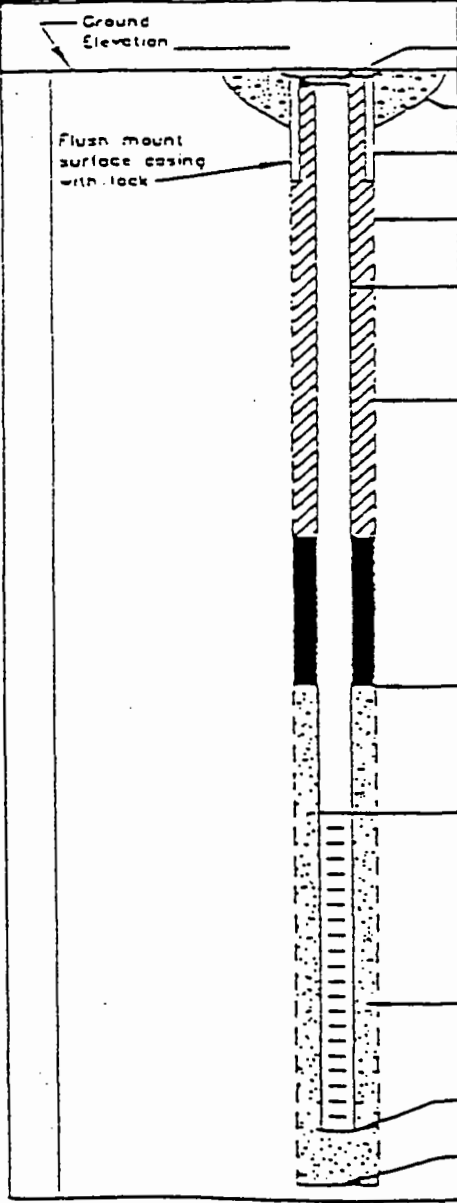
DEPTH/ELEVATION BOTTOM OF HOLE: 15.5'

BACKFILL MATERIAL BELOW SAND: _____

Subject FIELD DOCUMENTATION	Number SA-6.3	Page 23 of 32
	Revision 0	Effective Date 03/01/96

ATTACHMENT C-5A
EXAMPLE OVERBURDEN MONITORING WELL SHEET (FLUSHMOUNT)

		BORING NO.: _____
<h2 align="center">MONITORING WELL SHEET</h2>		
<p><i>Site 300</i></p>		
PROJECT <u>CTO 0027</u>	LOCATION <u>Central System Station</u>	DRILLER <u>William Lindsey</u>
PROJECT NO. <u>7540</u>	BORING <u>PV-300-MW-02</u>	DRILLING METHOD <u>Follow stem Auger 4 1/4"</u>
ELEVATION <u>6/1</u>	DATE <u>4/22/97</u>	DEVELOPMENT METHOD <u>Submersible Pump</u>
FIELD GEOLOGIST <u>John G. Webster</u>		

	ELEVATION TOP OF RISER:	_____
	TYPE OF SURFACE SEAL:	_____
	TYPE OF PROTECTIVE CASING:	<u>Steel</u>
	I.D. OF PROTECTIVE CASING:	<u>Man Hole</u>
	DIAMETER OF HOLE:	<u>4.25 ID Augers - 9 inch bore hole</u>
	TYPE OF RISER PIPE:	<u>PVC</u>
	RISER PIPE I.D.:	<u>2" 5'</u>
	TYPE OF BACKFILL/SEAL:	<u>1/2 inch Bentonite Tablets</u> <u>6" above filter pack - Sodium Bentonite</u>
	DEPTH/ELEVATION TOP OF SAND:	<u>3'</u>
	DEPTH/ELEVATION TOP OF SCREEN:	<u>5'</u>
	TYPE OF SCREEN:	<u>PVC</u>
	SLOT SIZE x LENGTH:	<u>.010 x 10'</u>
	TYPE OF SAND PACK:	<u>20/30 6 bags</u>
	DIAMETER OF HOLE IN BEDROCK:	<u>4.25 ID Augers - 9 inch bore hole</u>
	DEPTH/ELEVATION BOTTOM OF SCREEN:	<u>15'</u>
DEPTH/ELEVATION BOTTOM OF SAND:	<u>15.5'</u>	
DEPTH/ELEVATION BOTTOM OF HOLE:	<u>15.5'</u>	
BACKFILL MATERIAL BELOW SAND:	_____	

Subject

FIELD DOCUMENTATION

Number

SA-6.3

Page

23 of 32

Revision

0

Effective Date

03/01/96

ATTACHMENT C-5A
EXAMPLE OVERBURDEN MONITORING WELL SHEET (FLUSHMOUNT)

Site 300

BORING NO.: _____



MONITORING WELL SHEET

PROJECT CTO 0027PROJECT NO. 7540ELEVATION G/LFIELD GEOLOGIST John C. WebsterLOCATION Coastal System StationBORING PV-300-MW-02DATE 4/22/97DRILLER William Lindsey

DRILLING

METHOD Hand auger 4 1/2" ID

DEVELOPMENT


METHOD Submersible Pump

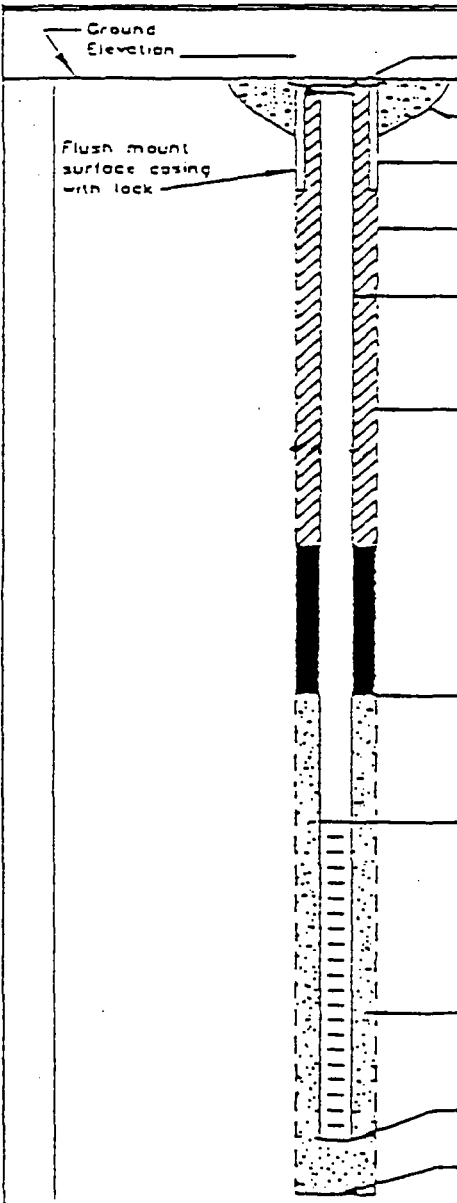
	ELEVATION TOP OF RISER:	_____
	TYPE OF SURFACE SEAL:	_____
	TYPE OF PROTECTIVE CASING:	<u>Steel</u>
	I.D. OF PROTECTIVE CASING:	<u>8"</u>
	DIAMETER OF HOLE:	<u>4.25 ID augers - 8 inch bore hole</u>
	TYPE OF RISER PIPE:	<u>PVC</u>
	RISER PIPE I.D.:	<u>2 5'</u>
	TYPE OF BACKFILL/SEAL:	<u>1/2 inch Bentonite Tablets</u> <u>6" above filter pack Sodium Bentonite</u>
	DEPTH/ELEVATION TOP OF SAND:	<u>3'</u>
	DEPTH/ELEVATION TOP OF SCREEN:	<u>5'</u>
TYPE OF SCREEN:	<u>PVC</u>	
SLOT SIZE x LENGTH:	<u>.010 x 10</u>	
TYPE OF SAND PACK:	<u>20/30 - 6 bags</u>	
DIAMETER OF HOLE IN BEDROCK:	<u>4.25 ID Augers - 8 inch bore hole</u>	
DEPTH/ELEVATION BOTTOM OF SCREEN:	<u>15'</u>	
DEPTH/ELEVATION BOTTOM OF SAND:	<u>16'</u>	
DEPTH/ELEVATION BOTTOM OF HOLE:	<u>16'</u>	
BACKFILL MATERIAL BELOW SAND:	_____	

Subject FIELD DOCUMENTATION	Number SA-6.3	Page 23 of 32
	Revision 0	Effective Date 03/01/96

ATTACHMENT C-5A
EXAMPLE OVERBURDEN MONITORING WELL SHEET (FLUSHMOUNT)

Site 300

		BORING NO.: _____
<p align="center"><u>Site 300</u></p> <h2 align="center">MONITORING WELL SHEET</h2>		
PROJECT <u>CTD0027</u> PROJECT NO. <u>7540</u> ELEVATION <u>6 1/2</u> FIELD GEOLOGIST <u>John G. Webster</u>	LOCATION <u>Coastal System Station</u> BORING <u>PCY-300-MW-04</u> DATE <u>4/22/97</u>	DRILLER <u>William Lindsey</u> DRILLING METHOD <u>Willow stem Auger 4 1/4"</u> DEVELOPMENT METHOD <u>Submersible pump</u>

	ELEVATION TOP OF RISER: _____
	TYPE OF SURFACE SEAL: _____
	TYPE OF PROTECTIVE CASING: <u>Steel-man hole</u>
	I.D. OF PROTECTIVE CASING: <u>8"</u>
	DIAMETER OF HOLE: <u>4.25 Auger - 8 inch bore hole</u>
	TYPE OF RISER PIPE: <u>PVC</u>
	RISER PIPE I.D.: <u>2" 5'</u>
	TYPE OF BACKFILL/SEAL: <u>1/2 inch Bentonite Tablets</u> <u>6" above filter pack - Sodium Bentonite</u>
	DEPTH/ELEVATION TOP OF SAND: <u>3'</u>
	DEPTH/ELEVATION TOP OF SCREEN: <u>5'</u>
TYPE OF SCREEN: <u>PVC</u>	
SLOT SIZE x LENGTH: <u>.010 x 10'</u>	
TYPE OF SAND PACK: <u>20/30 - 6 bags</u>	
DIAMETER OF HOLE IN BEDROCK: <u>4.75 Augers - 8 inch bore hole</u>	
DEPTH/ELEVATION BOTTOM OF SCREEN: <u>15'</u>	
DEPTH/ELEVATION BOTTOM OF SAND: <u>15.5'</u>	
DEPTH/ELEVATION BOTTOM OF HOLE: <u>15.5'</u>	
BACKFILL MATERIAL BELOW SAND: _____	



MONITORING WELL SHEET

BORING NO. SB07
PZ-1

PROJECT CTO 0027 LOCATION G-300
PROJECT NO. 7540 BORING SB07
ELEVATION Relative DATE 3/19/97 to 3/21/97
FIELD GEOLOGIST Gerald Goode

DRILLER Jason Anglin
DRILLING
METHOD Hand-Auger
DEVELOPMENT
METHOD Peristaltic Pump

Ground Elevation

ELEVATION TOP OF RISER: 10.44'

2-inch dia pvc well cap sleeve

TYPE OF SURFACE SEAL: Portland Cement

TYPE OF PROTECTIVE CASING:

I.D. OF PROTECTIVE CASING:

DIAMETER OF HOLE: 3"

TYPE OF RISER PIPE: SC4. 40 Threaded PVC

RISER PIPE O.D.: 1 1/4" Rubber O-Rings

TYPE OF BACKFILL/SEAL: Portland Cement

8-inch Steel Manhole (Diameter)

Flush mount surface casing with lock

Bubble pellets 2 to 3' bls

DEPTH/ELEVATION TOP OF SAND: 3' 17.44'

DEPTH/ELEVATION TOP OF SCREEN: 4' 16.44'

TYPE OF SCREEN: SC4. 40 PVC 1 1/4" OD (Threaded/Rubber O-Rings)

SLOT SIZE x LENGTH: 0.010" slot w/ 10' screen

TYPE OF SAND PACK: Natural Sand Pack to 3' bls

DIAMETER OF HOLE IN BEDROCK: N/A

DEPTH/ELEVATION BOTTOM OF SCREEN: 14' 1-3.56'

DEPTH/ELEVATION BOTTOM OF SAND: 14' 1-3.56'

DEPTH/ELEVATION BOTTOM OF HOLE: 14' 1-3.56'

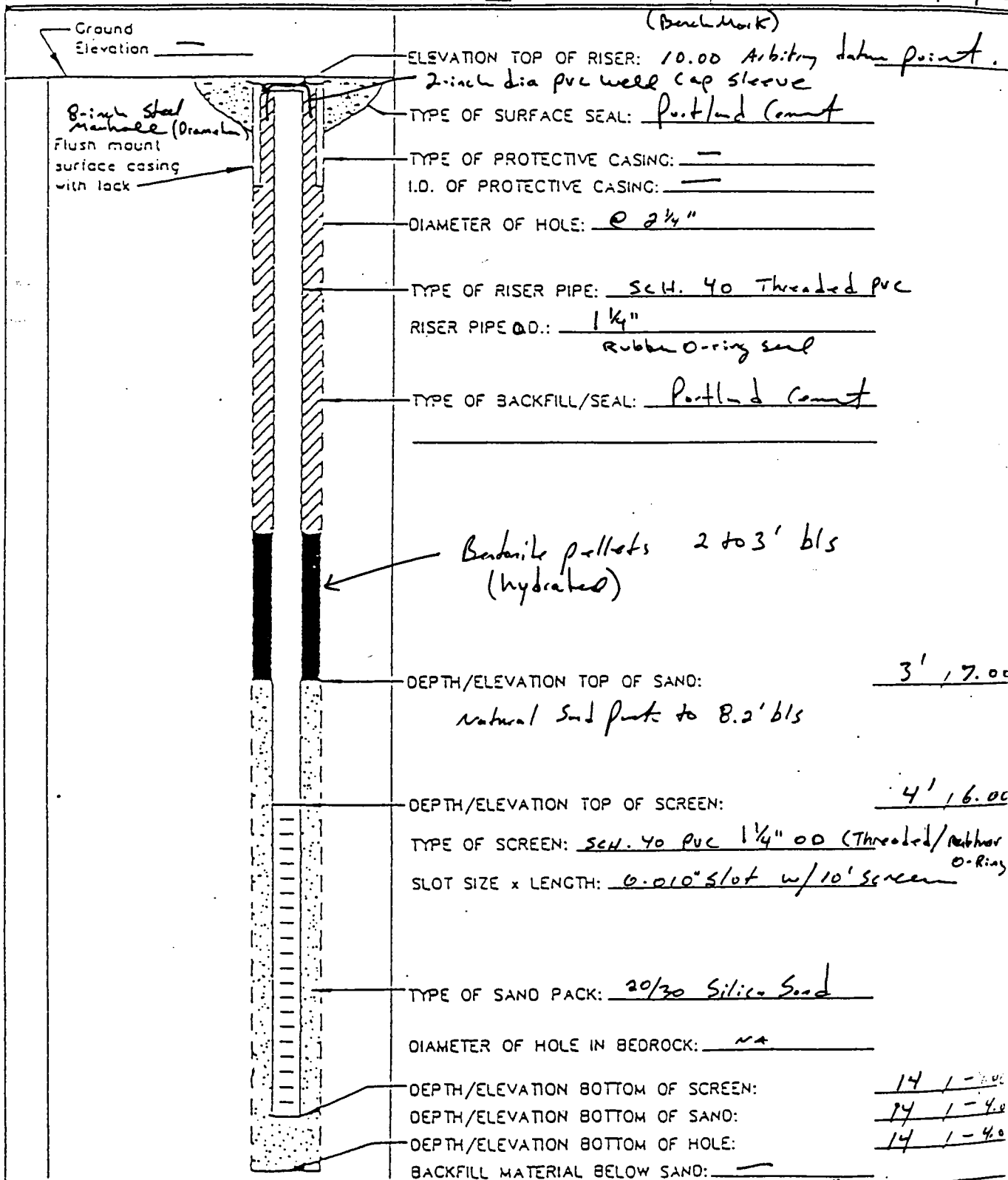
BACKFILL MATERIAL BELOW SAND:

BURING NO. SB08
PZ-2

MONITORING WELL SHEET

PROJECT CTO 0027 LOCATION G-300
PROJECT NO. 7540 BORING SB08
ELEVATION Relative DATE 3/19/97 to 3/21/97
FIELD GEOLOGIST Gerald Goode

DRILLER Jason Anglin
DRILLING
METHOD Direct Push
DEVELOPMENT
METHOD Peristaltic Pump





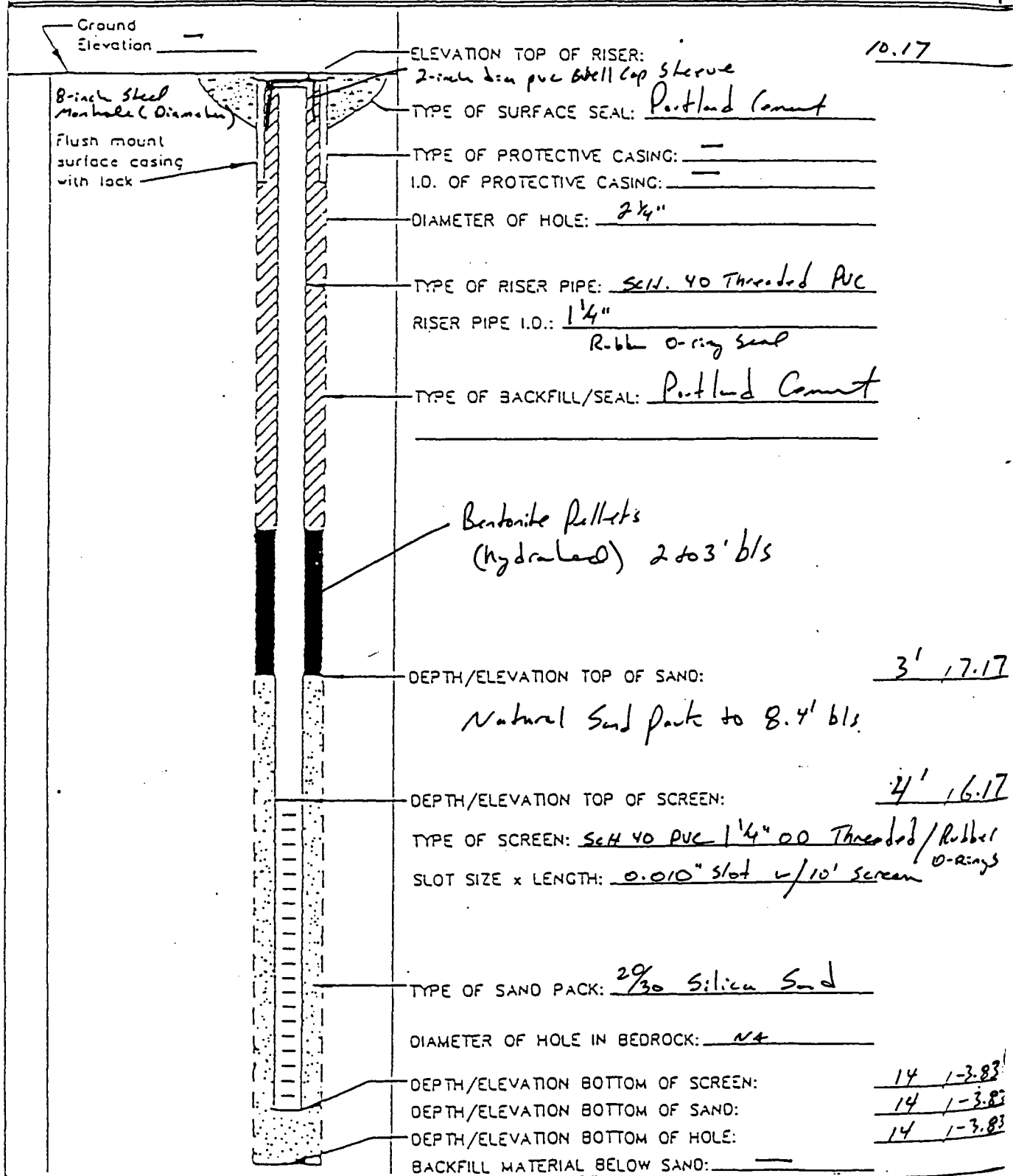
MONITORING WELL SHEET

PROJECT CTD 0027LOCATION G-300PROJECT NO. 7540BORING SB10ELEVATION RelativeDATE 3/19/97 to 3/21/97FIELD GEOLOGIST Gerald GoudeDRILLER Jason Anglin

DRILLING

METHOD Direct Push

DEVELOPMENT

METHOD Peristaltic Pump

APPENDIX I

FIELD SCREENING TPH-DRO DATA SHEETS FOR GROUNDWATER AND SOIL



DATA REPORT

BROWN & ROOT ENVIRONMENTAL
1311 EXECUTIVE CENTER DRIVE - ELLIS BUILDING, SUITE 220
TALLAHASSEE, FL 32301

CSS, PANAMA CITY, FL - SITE G-300
PROJECT NO. CTO 0027 (7540)

TEG PROJECT # 1-97178-A1

TPH-DRO ANALYSIS OF WATER (EPA METHOD 3510/8015 Mod.)

DATA REPORTED IN MILLIGRAMS PER LITER (PPM)

SAMPLE ID	DATE COLLECTED	DATE ANALYZED	TPH-DRO (mg/L)	Surrogate Recovery (%)	Data Qualifiers	PQL
METHOD BLANK	—	3/18/97	ND	108		0.50
G300-SB01-GW-1012	3/18/97	3/18/97	ND	104		0.50
G300-SB02-GW-1012	3/18/97	3/18/97	ND	94.5		0.50
G300-SB03-GW-1012	3/18/97	3/18/97	ND	105		0.50
G300-SB04-GW-1012	3/18/97	3/18/97	1.78	95.9		0.50
METHOD BLANK	—	3/19/97	ND	107		0.50
G300-SB05-GW-1012	3/18/97	3/19/97	ND	101		0.50
G300-SB06-GW-1012	3/19/97	3/19/97	ND	97.6		0.50
G300-SB07-GW-1214	3/19/97	3/19/97	ND	85.1		0.50
G300-SB08-GW-1012	3/19/97	3/19/97	ND	92.3		0.50
G300-SB09-GW-1011	3/19/97	3/19/97	17.4	106		0.50
METHOD BLANK	—	3/20/97	ND	107		0.50
G300-SB09-GW-1011 DUP	3/19/97	3/20/97	15.5	95.1		0.50
G300-SB10-GW-1011	3/19/97	3/20/97	ND	98.4		0.50
G300-SB11-GW-1012	3/20/97	3/20/97	ND	85.1		0.50
G300-SB12-GW-1012	3/20/97	3/20/97	2.83	87.0		0.50
G300-SB13-GW-1012	3/20/97	3/20/97	0.875	108		0.50
G300-SB14-GW-1012	3/20/97	3/20/97	10.0	95.1		0.50
G300-SB15-GW-1012	3/20/97	3/21/97	ND	MI		0.50

"ND" INDICATES ANALYTE NOT DETECTED AT OR ABOVE LISTED PRACTICAL QUANTITATION LIMITS (PQL'S)

ANALYSIS PERFORMED IN TEG'S CERTIFIED MOBILE LABORATORY

ANALYSIS PERFORMED BY: MATTHEW STEERE

DATA REVIEWED BY: JONATHAN R. MILLER, RHSP

DATA QUALIFIERS

MI = MATRIX INTERFERENCE

DO = SURROGATE SPIKE DILUTED OUT

D = SAMPLE VALUE OBTAINED BY DILUTION, PQL IS ADJUSTED ACCORDINGLY

E = ESTIMATED CONCENTRATION(S)

197178A2.XLS



QA/QC DATA REPORT

BROWN & ROOT ENVIRONMENTAL
1311 EXECUTIVE CENTER DRIVE - ELLIS BUILDING, SUITE 220
TALLAHASSEE, FL 32301

CSS, PANAMA CITY, FL - SITE G-300
PROJECT NO. CTO 0027 (7540)

TEG PROJECT # 1-97178-A1

TPH-DRO ANALYSIS OF WATER (EPA METHOD 3510/8015 Mod.)

DATE ANALYZED: 2/6/97

	TPH-DRO (mg/L)
MATRIX SPIKE	
SPIKED CONC.	5.00
MEASURED CONC.	5.27
% RECOVERY	105.4%
MATRIX SPIKE DUPLICATE	
SPIKED CONC.	5.00
MEASURED CONC.	4.97
% RECOVERY	99.4%
RELATIVE PERCENT DIFFERENCE (RPD)	5.9%

ANALYSIS PERFORMED IN TEG'S CERTIFIED MOBILE LABORATORY

ANALYSIS PERFORMED BY: MATTHEW STEERE

DATA REVIEWED BY: JONATHAN R. MILLER, RHSP

Jonathan R. Miller
3/19/97



DATA REPORT

BROWN & ROOT ENVIRONMENTAL
1311 EXECUTIVE CENTER DRIVE - ELLIS BUILDING, SUITE 220
TALLAHASSEE, FL 32301

CSS, PANAMA CITY, FL - SITE G-300
PROJECT NO. CTO 0027 (7540)

TEG PROJECT # 1-97178-A1

TPH-DRO ANALYSIS OF SOIL (EPA METHOD 3550/8015 Mod.)

DATA REPORTED IN MILLIGRAMS PER KILOGRAM (PPM)

SAMPLE ID	DATE COLLECTED	DATE ANALYZED	TPH-DRO (mg/kg)	Surrogate Recovery (%)	Data Qualifiers	PQL
METHOD BLANK	—	3/18/97	ND	122		10
G300-SB01-SS-0810	3/18/97	3/18/97	ND	117		10
G300-SB02-SS-0607	3/18/97	3/18/97	ND	121		10
G300-SB03-SS-0607	3/18/97	3/18/97	ND	119		10
METHOD BLANK	—	3/19/97	ND	118		10
G300-SB04-SS-0507	3/18/97	3/19/97	7280	DO	D	40
G300-SB04-SS-0507 DUP	3/18/97	3/19/97	7240	DO	D	40
G300-SB05-SS-0507	3/18/97	3/19/97	4820	121		10
G300-SB06-SS-0507	3/19/97	3/19/97	ND	108		10
G300-SB07-SS-0406	3/19/97	3/19/97	ND	126		10
G300-SB08-SS-0507	3/19/97	3/19/97	ND	117		10
G300-SB09-SS-0607	3/19/97	3/19/97	4980	87.2		10
METHOD BLANK	—	3/20/97	ND	94.8		10
G300-SB10-SS-0507	3/19/97	3/20/97	ND	91.0		10
G300-SB11-SS-0507	3/20/97	3/20/97	ND	87.2		10
G300-SB12-SS-0507	3/20/97	3/20/97	ND	102		10
G300-SB13-SS-0507	3/20/97	3/20/97	22.1	98.6		10
G300-SB14-SS-0507	3/20/97	3/20/97	ND	103		10
G300-SB15-SS-0507	3/20/97	3/21/97	ND	752		10

"ND" INDICATES ANALYTE NOT DETECTED AT OR ABOVE LISTED PRACTICAL QUANTITATION LIMITS (PQL'S)

ANALYSIS PERFORMED IN TEG'S CERTIFIED MOBILE LABORATORY

ANALYSIS PERFORMED BY: MATTHEW STEERE

DATA REVIEWED BY: JONATHAN R. MILLER, RHSP

DATA QUALIFIERS

MI = MATRIX INTERFERENCE

DO = SURROGATE SPIKE DILUTED OUT

D = SAMPLE VALUE OBTAINED BY DILUTION, PQL IS ADJUSTED ACCORDINGLY

E = ESTIMATED CONCENTRATION(S)

197178A1.XLS



QA/QC DATA REPORT

BROWN & ROOT ENVIRONMENTAL
1311 EXECUTIVE CENTER DRIVE - ELLIS BUILDING, SUITE 220
TALLAHASSEE, FL 32301

CSS, PANAMA CITY, FL - SITE G-300
PROJECT NO. CTO 0027 (7540)

TEG PROJECT # 1-97178-A1

TPH-DRO ANALYSIS OF SOIL (EPA METHOD 3550/8015 Mod.)

DATE ANALYZED: 3/17/97

TPH-DRO (mg/kg)	
MATRIX SPIKE	
SPIKED CONC.	500
MEASURED CONC.	464
% RECOVERY	92.8%
MATRIX SPIKE DUPLICATE	
SPIKED CONC.	500
MEASURED CONC.	482
% RECOVERY	96.4%
RELATIVE PERCENT DIFFERENCE (RPD)	3.8%

ANALYSIS PERFORMED IN TEG'S CERTIFIED MOBILE LABORATORY

ANALYSIS PERFORMED BY: MATTHEW STEERE

DATA REVIEWED BY: JONATHAN R. MILLER, RHSP

JS
3/18/97



TRANSGLOBAL
ENVIRONMENTAL
GEOCHEMISTRY, INC.

CHAIN-OF-CUSTODY RECORD

CLIENT: BROWN & ROOT Environmental
ADDRESS: 1311 Executive Center Drive Ellis Building, Suite 220
CITY: Orlando, FL STATE: FL ZIP: 32801
PHONE: (407) 545-7400 FAX: (407) 545-7403
CLIENT PROJECT #: 011-007 (2500) PROJECT MANAGER: Paul Colligan

DATE: MARCH 18, 1997 PAGE 1 OF 1
TEG PROJECT #: 1-99178 A1
LOCATION: USE, PANAMA CITY
COLLECTOR: W. L. ... DATE OF COLLECTION: 3/18/97

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES														FIELD NOTES	Total Number Of Containers	Laboratory Note Number																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
					VOA 601/8010	VOA 602/8020	VOA 824/8240	Semi Vol 625/8270	TPH 418.1	TPH 8015 (gasoline)	TPH 8015 (diesel)	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	PH	ASBESTOS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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RELINQUISHED BY: (Signature) W. L. ... DATE/TIME 3/18/97

RECEIVED BY: (Signature) Paul Colligan DATE/TIME 3/18/97

RELINQUISHED BY: (Signature) W. L. ... DATE/TIME 3/18/97

RECEIVED BY: (Signature) Paul Colligan DATE/TIME 3/18/97

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ \$2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS

CHAIN OF CUSTODY SEALS Y/N/NA

SEALS INTACT? Y/N/NA

RECEIVED GOOD COND./COLD

NOTES:

LABORATORY NOTES:



TRANSGLOBAL
ENVIRONMENTAL
GEOCHEMISTRY.

CHAIN-OF-CUSTODY RECORD

P.O. #:

CLIENT: BROWN & ROOT ENVIRONMENTAL
 ADDRESS: 1311 EXECUTIVE CENTER DRIVE ELLIS BLDG. 1 SUITE 220
TALLAHASSEE, FL
 PHONE: (904) 656-5498 FAX: (904) 656-7403
 CLIENT PROJECT #: CTO 0027(7510) PROJECT MANAGER: PAUL CULLIGAN

DATE: MARCH 19, 1997 PAGE OF
 TEG PROJECT #: 1-97178-A1
 LOCATION: CSS, PANAMA CITY, FL
 COLLECTOR: DATE OF COLLECTION: 3/19/97

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES														FIELD NOTES	Total Number Of Containers	Laboratory Note Number																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
					VOA 601/8010	VOA 602/8020	VOA 624/8240	Semi Vol 625/8250	TPH 418.1	TPH 8015	TPH 8015 (gasoline)	TPH 8015 (diesel)	PNA 610/8100	PEST/PCBs 8080	HEX CHROME	ORGANIC LEAD	TOTAL LEAD	PH				ASBESTOS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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RELINQUISHED BY (Signature) Paul Culligan DATE/TIME 3/19/97
 RECEIVED BY (Signature) Paul Culligan DATE/TIME 3/19/97
 RELINQUISHED BY (Signature) DATE/TIME
 RECEIVED BY (Signature) DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

TEG DISPOSAL @ \$2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS
 CHAIN OF CUSTODY SEALS Y/N/NA
 SEALS INTACT? Y/N/NA
 RECEIVED GOOD COND./COLD
 NOTES:

LABORATORY NOTES:

CHAIN-OF-CUSTODY RECORD
P.O. #:

CLIENT: BROWN & ROOT ENVIRONMENTAL
ADDRESS: 1311 EXECUTIVE CENTER DRIVE ELLIS BLVD., SUITE 220
PHONE: (904) 156-5428 FAX: (904) 156-7403
CLIENT PROJECT #: OTO 0027(7540) PROJECT MANAGER: Paul Colligan

DATE: MARCH 20, 1997 PAGE 1 OF 1
TEG PROJECT #: 1-77178-A1
LOCATION: CSS PANAMA CITY, FL
COLLECTOR: _____ DATE OF COLLECTION: 3/20/97

[illegible]

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
<i>Mark G. [Signature]</i>		<i>Mark G. [Signature]</i>	3/20/97
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS
CHAIN OF CUSTODY SEALS Y/N/NA
SEALS INTACT? Y/N/NA
RECEIVED GOOD COND./COLD
NOTES:

LABORATORY NOTES:

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ \$2.00 each ☐ Return ☐ Pickup

APPENDIX J

SOIL LABORATORY DATA SHEETS

Technical Report for**Brown & Root Environmental**

Site G300 CTO 0027

7540


Accutest Job Number: F581

Report to:

C/O Paul Calligan
Brown & Root Environmental
1311 Executive Center Dr. Ste: 220
Tallahassee, FL 32301

ATTN: Arnold Lamb - QA Officer

Total number of pages in report: 26


Harry Behzadi, Ph.D.
Laboratory Director

Results relate only to the items tested.

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.



Sample Summary

Brown & Root Environmental

Date: 05/09/97

Job No: F581

Site G300 CTO 0027

Project No: 7540

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
F581-1	04/23/97	16:00 GG	04/25/97	SO	Soil	300-SB01-0607
F581-2	04/23/97	16:20 GG	04/25/97	AQ	Field Blank Water	300-SB01-0607B
F581-3	04/23/97	16:45 GG	04/25/97	SO	Soil	300-SB-05-0607
F581-4	04/23/97	17:00 GG	04/25/97	SO	Soil	300-SB-04-0607
F581-5	04/17/97	16:00 GG	04/25/97	AQ	Trip Blank Water	TRIP BLANK



Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB01-O607
Lab Sample ID: F581-1
Matrix: SO - Soil
Method: EPA 8100
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 97.7

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01473.D	1	04/28/97	NF	04/28/97	OP85	GU69
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	340	ug/kg	
208-96-8	Acenaphthylene	ND	340	ug/kg	
120-12-7	Anthracene	ND	340	ug/kg	
56-55-3	Benzo(a)anthracene	ND	340	ug/kg	
50-32-8	Benzo(a)pyrene	ND	340	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	340	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	340	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	340	ug/kg	
218-01-9	Chrysene	ND	340	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	340	ug/kg	
206-44-0	Fluoranthene	ND	340	ug/kg	
86-73-7	Fluorene	ND	340	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	340	ug/kg	
91-20-3	Naphthalene	ND	340	ug/kg	
90-12-0	1-Methylnaphthalene	ND	340	ug/kg	
91-57-6	2-Methylnaphthalene	ND	340	ug/kg	
85-01-8	Phenanthrene	ND	340	ug/kg	
129-00-0	Pyrene	ND	340	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	65%		35-120%
84-15-1	o-Terphenyl	74%		35-120%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB01-O607
Lab Sample ID: F581-1
Matrix: SO - Soil
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 97.7

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01578.D	1	05/02/97	NF	05/01/97	OP74	GIJ73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	11.0	8.5	mg/kg	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	66%		40-140%
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ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-SB01-0607
 Lab Sample ID: F581-1
 Matrix: SO - Soil
 Method: SW846 8010/8020
 Project: Site G300 CTO 0027

Date Sampled: 04/23/97
 Date Received: 04/25/97
 Percent Solids: 97.7

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002016.D	1	04/25/97	AW	n/a	n/a	GEF51
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/kg	
75-25-2	Bromoform	ND	1.0	ug/kg	
75-27-4	Bromodichloromethane	ND	1.0	ug/kg	
74-83-9	Bromomethane	ND	1.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	1.0	ug/kg	
108-90-7	Chlorobenzene	ND	1.0	ug/kg	
75-00-3	Chloroethane	ND	1.0	ug/kg	
67-66-3	Chloroform	ND	1.0	ug/kg	
74-87-3	Chloromethane	ND	1.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/kg	
124-48-1	Dibromochloromethane	ND	1.0	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/kg	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	ug/kg	
75-09-2	Methylene chloride	ND	5.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/kg	
127-18-4	Tetrachloroethene	ND	1.0	ug/kg	
108-88-3	Toluene	ND	1.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/kg	
79-01-6	Trichloroethene	ND	1.0	ug/kg	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/kg	
75-01-4	Vinyl chloride	ND	1.0	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/kg	
1330-20-7	Xylenes (total)	ND	3.0	ug/kg	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/kg	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 2 of 2

Client Sample ID: 300-SB01-O607
Lab Sample ID: F581-1
Matrix: SO - Soil
Method: SW846 8010/8020
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 97.7

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002016.D	1	04/25/97	AW	n/a	n/a	GEF51
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	73 %		50-150 %

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB01-O607

Lab Sample ID: F581-1

Matrix: SO - Soil

Project: Site G300 CTO 0027

Date Sampled: 04/23/97

Date Received: 04/25/97

Percent Solids: 97.7

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	26.6	3.1	mg/kg	10	05/05/97	05/09/97 JK	SW846 7421

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 1

Client Sample ID:	300-SB01-0607B	Date Sampled:	04/23/97
Lab Sample ID:	F581-2	Date Received:	04/25/97
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	EPA 8100		
Project:	Site G300 CTO 0027		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01451.D	1	04/25/97	NF	04/25/97	OP83	GLJ68
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	10	ug/l	
208-96-8	Acenaphthylene	ND	10	ug/l	
120-12-7	Anthracene	ND	10	ug/l	
56-55-3	Benzo(a)anthracene	ND	10	ug/l	
50-32-8	Benzo(a)pyrene	ND	10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l	
218-01-9	Chrysene	ND	10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l	
206-44-0	Fluoranthene	ND	10	ug/l	
86-73-7	Fluorene	ND	10	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l	
91-20-3	Naphthalene	ND	10	ug/l	
90-12-0	1-Methylnaphthalene	ND	10	ug/l	
91-57-6	2-Methylnaphthalene	ND	10	ug/l	
85-01-8	Phenanthrene	ND	10	ug/l	
129-00-0	Pyrene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	78%		26-116%
84-15-1	o-Terphenyl	94%		26-125%

ND = Not detected
 RDL = Reported Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates that analyte is found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

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Client Sample ID: 300-SB01-0607B
Lab Sample ID: F581-2
Matrix: AQ - Field Blank Water
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01594.D	1	05/02/97	NF	04/30/97	OP89	GLJ73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	ND	0.50	mg/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	69%	—	40-140%
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ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID:	300-SB01-0607B	Date Sampled:	04/23/97
Lab Sample ID:	F581-2	Date Received:	04/25/97
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	EPA 8010/8020		
Project:	Site G300 CTO 0027		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002015.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	2.5	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 2 of 2

Client Sample ID: 300-SB01-0607B
Lab Sample ID: F581-2
Matrix: AQ - Field Blank Water
Method: EPA 8010/8020
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002015.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	100%		75-125 %

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB01-0607B
Lab Sample ID: F581-2
Matrix: AQ - Field Blank Water
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	<0.0030	0.0030	mg/l	1	05/02/97	05/08/97 JK	EPA 239.2

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB-05-0607
Lab Sample ID: F581-3
Matrix: SO - Soil
Method: EPA 8100
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 93.2

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	I01477.D	20	04/29/97	NF	04/28/97	OP85	GIJ69
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	7200	ug/kg	
208-96-8	Acenaphthylene	ND	7200	ug/kg	
120-12-7	Anthracene	ND	7200	ug/kg	
56-55-3	Benzo(a)anthracene	ND	7200	ug/kg	
50-32-8	Benzo(a)pyrene	ND	7200	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	7200	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	7200	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	7200	ug/kg	
218-01-9	Chrysene	ND	7200	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	7200	ug/kg	
206-44-0	Fluoranthene	ND	7200	ug/kg	
86-73-7	Fluorene	ND	7200	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7200	ug/kg	
91-20-3	Naphthalene	ND	7200	ug/kg	
90-12-0	1-Methylnaphthalene	ND	7200	ug/kg	
91-57-6	2-Methylnaphthalene	ND	7200	ug/kg	
85-01-8	Phenanthrene	ND	7200	ug/kg	
129-00-0	Pyrene	ND	7200	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	0% ^b		35-120 %
84-15-1	o-Terphenyl	0% ^b		35-120 %

(a) Elevated detection limit due to matrix interference.

(b) Outside control limits due to dilution.

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB-05-0607
Lab Sample ID: F581-3
Matrix: SO - Soil
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 93.2

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01579.D	40	05/02/97	NF	05/01/97	OP74	GLJ73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	2020	360	mg/kg	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	0%		40-140%
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(a) Outside control limits due to dilution.

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-SB-05-0607		Date Sampled: 04/23/97
Lab Sample ID: F581-3		Date Received: 04/25/97
Matrix: SO - Soil		Percent Solids: 93.2
Method: SW846 8010/8020		
Project: Site G300 CTO 0027		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 *	EF002019.D	10	04/25/97	AW	n/a	n/a	GEF51
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	11	ug/kg	
75-25-2	Bromoform	ND	11	ug/kg	
75-27-4	Bromodichloromethane	ND	11	ug/kg	
74-83-9	Bromomethane	ND	11	ug/kg	
56-23-5	Carbon tetrachloride	ND	11	ug/kg	
108-90-7	Chlorobenzene	ND	11	ug/kg	
75-00-3	Chloroethane	ND	11	ug/kg	
67-66-3	Chloroform	ND	11	ug/kg	
74-87-3	Chloromethane	ND	11	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	11	ug/kg	
124-48-1	Dibromochloromethane	ND	11	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	11	ug/kg	
75-34-3	1,1-Dichloroethane	ND	11	ug/kg	
107-06-2	1,2-Dichloroethane	ND	11	ug/kg	
75-35-4	1,1-Dichloroethene	ND	11	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	11	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	11	ug/kg	
78-87-5	1,2-Dichloropropane	ND	11	ug/kg	
100-41-4	Ethylbenzene ^b	37.9	11	ug/kg	
75-09-2	Methylene chloride	ND	55	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	11	ug/kg	
127-18-4	Tetrachloroethene	ND	11	ug/kg	
108-88-3	Toluene	ND	11	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	11	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	11	ug/kg	
79-01-6	Trichloroethene	ND	11	ug/kg	
75-69-4	Trichlorofluoromethane	ND	11	ug/kg	
75-01-4	Vinyl chloride	ND	11	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	11	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	11	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	11	ug/kg	
1330-20-7	Xylenes (total) ^b	159	33	ug/kg	
156-69-4	cis-1,2-Dichloroethene	ND	11	ug/kg	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID: 300-SB-05-0607
Lab Sample ID: F581-3
Matrix: SO - Soil
Method: SW846 8010/8020
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 93.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EF002019.D	10	04/25/97	AW	n/a	n/a	GEF51
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	130%		50-150%

(a) Dilution required due to matrix interference.

(b) Confirmed by reanalysis on second column

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB-05-0607
Lab Sample ID: F581-3
Matrix: SO - Soil
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 93.2

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	2.6	0.32	mg/kg	1	05/05/97	05/06/97 JK	SW846 7421

RDL = Reported Detection Limit

Report of Analysis

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Client Sample ID: 300-SB-04-0607
 Lab Sample ID: F581-4
 Matrix: SO - Soil
 Method: EPA 8100
 Project: Site G300 CTO 0027

Date Sampled: 04/23/97
 Date Received: 04/25/97
 Percent Solids: 92.4

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01559.D	80	05/01/97	NF	04/28/97	OP85	GU72
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	30000	ug/kg	
208-96-8	Acenaphthylene	ND	30000	ug/kg	
120-12-7	Anthracene	ND	30000	ug/kg	
56-55-3	Benzo(a)anthracene	ND	30000	ug/kg	
50-32-8	Benzo(a)pyrene	ND	30000	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	30000	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	30000	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	30000	ug/kg	
218-01-9	Chrysene	ND	30000	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	30000	ug/kg	
206-44-0	Fluoranthene	ND	30000	ug/kg	
86-73-7	Fluorene	ND	30000	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	30000	ug/kg	
91-20-3	Naphthalene	19500	30000	ug/kg	J
90-12-0	1-Methylnaphthalene	55600	30000	ug/kg	
91-57-6	2-Methylnaphthalene	63300	30000	ug/kg	
85-01-8	Phenanthrene	ND	30000	ug/kg	
129-00-0	Pyrene	ND	30000	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	0% ^b		35-120%
84-15-1	o-Terphenyl	0% ^b		35-120%

(a) All hits confirmed by dual column analysis.

(b) Outside control limits due to dilution.

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	300-SB-04-0607	Date Sampled:	04/23/97
Lab Sample ID:	F581-4	Date Received:	04/25/97
Matrix:	SO - Soil	Percent Solids:	92.4
Method:	FLORIDA-PRO		
Project:	Site G300 CTO 0027		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01580.D	100	05/02/97	NF	05/01/97	OP74	GLJ73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	5390	930	mg/kg	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	0% ^a		40-140%
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(a) Outside control limits due to dilution.

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-SB-04-0607
Lab Sample ID: F581-4
Matrix: SO - Soil
Method: SW846 8010/8020
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 92.4

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	EF002020.D	50	04/25/97	AW	n/a	n/a	GEF51

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	55	ug/kg	
75-25-2	Bromoform	ND	55	ug/kg	
75-27-4	Bromodichloromethane	ND	55	ug/kg	
74-83-9	Bromomethane	ND	55	ug/kg	
56-23-5	Carbon tetrachloride	ND	55	ug/kg	
108-90-7	Chlorobenzene	ND	55	ug/kg	
75-00-3	Chloroethane	ND	55	ug/kg	
67-66-3	Chloroform	ND	55	ug/kg	
74-87-3	Chloromethane	ND	55	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	55	ug/kg	
124-48-1	Dibromochloromethane	ND	55	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	55	ug/kg	
75-34-3	1,1-Dichloroethane	ND	55	ug/kg	
107-06-2	1,2-Dichloroethane	ND	55	ug/kg	
75-35-4	1,1-Dichloroethene	ND	55	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	55	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	55	ug/kg	
78-87-5	1,2-Dichloropropane	ND	55	ug/kg	
100-41-4	Ethylbenzene ^b	1260	55	ug/kg	
75-09-2	Methylene chloride	ND	280	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	55	ug/kg	
127-18-4	Tetrachloroethene	ND	55	ug/kg	
108-88-3	Toluene	ND	55	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	55	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	55	ug/kg	
79-01-6	Trichloroethene	ND	55	ug/kg	
75-69-4	Trichlorofluoromethane	ND	55	ug/kg	
75-01-4	Vinyl chloride	ND	55	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	55	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	55	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	55	ug/kg	
1330-20-7	Xylenes (total) ^b	4320	160	ug/kg	
156-69-4	cis-1,2-Dichloroethene	ND	55	ug/kg	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID: 300-SB-04-0607
Lab Sample ID: F581-4
Matrix: SO - Soil
Method: SW846 8010/8020
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: 92.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 *	EF002020.D	50	04/25/97	AW	n/a	n/a	GEF51
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	97%		50-150 %

(a) Dilution required due to matrix interference.

(b) Confirmed by reanalysis on second column

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-SB-04-0607

Lab Sample ID: F581-4

Matrix: SO - Soil

Project: Site G300 CTO 0027

Date Sampled: 04/23/97

Date Received: 04/25/97

Percent Solids: 92.4

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	2.2	0.32	mg/kg	1	05/05/97	05/06/97 JK	SW846 7421

RDL = Reported Detection Limit

Report of Analysis

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Client Sample ID: TRIP BLANK
Lab Sample ID: F581-5
Matrix: AQ - Trip Blank Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/17/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002014.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	2.2	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID:	TRIP BLANK	Date Sampled:	04/17/97
Lab Sample ID:	F581-5	Date Received:	04/25/97
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 601/602		
Project:	Site G300 CTO 0027		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002014.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	100%		75-125 %

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound

Environmental

100 Fairway Drive Suite 200

Deerfield Beach, Florida 33441

TELEPHONE (205) 570-5885 FAX: (205) 570-5974

SITE MANAGER: Paul Calligen

PROJECT NAME: Site G300 CTO 0027

BRE PROJECT NO.: 7540 CODE: -

P.O. NO.: 2049-7540-097159

SHIPPED IN

South
Orlando,

ATTN: Harry Benz
(LABORATORY NAME)

CHAIN OF CUSTODY RECORD

SAMPLED BY (PRINT): John G Webster; Gerald F. Goode

SAMPLER SIGNATURE: *John G Webster, Gerald F. Goode*

LAB NO.	DATE	TIME	SAMPLE IDENTIFICATION
F581-1	4/23/97	1600	300-SB01-0607
-2	4/23/97	1620	300-SB01-0607B
-3	4/23/97	1645	300-SB05-0607
-4	4/23/97	1700	300-SB04-0607
-5	4/17/97	1600	Trip Blank

SAMPLE
TYPE

COMP.

GRAB

MATRIX

PRES.
TYPE

PARAMETERS
8100/7210/1000
8010
8020
Pb
Trip Blank

8100/7210/1000
8010
8020
Pb
Trip Blank

8100/7210/1000
8010
8020
Pb
Trip Blank

8100/7210/1000
8010
8020
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Trip Blank

8100/7210/1000
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8010
8020
Pb
Trip Blank

8100/7210/1000
8010
8020
Pb
Trip Blank

8100/7210/1000
8010
8020
Pb
Trip Blank

☒ STANDARD TAT ☐ RUSH

☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS

RESULTS DUE DATE:

COMMENTS:

NOTE: Sample 300-SB01-0607B
(blank) Pb rinsate bottle
contained 14 NO₃

TOTAL NUMBER OF CONTAINERS 47842 325

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)

SEAL INTACT?

☒ YES ☐ NO ☐ N/A

DATE:

TIME:

RELINQUISHED BY (SIGNATURE)

SEAL INTACT?

☒ YES ☐ NO ☐ N/A

DATE: 4/23/97

TIME: 1800

RELINQUISHED BY (SIGNATURE)

SEAL INTACT?

☐ YES ☐ NO ☐ N/A

DATE:

TIME:

EMPTY BOTTLES RECEIVED BY (SIGNATURE)

SEAL INTACT?

☒ YES ☐ NO ☐ N/A

DATE: 4/23/97

TIME: 900 am

RECEIVED BY (SIGNATURE)

SEAL INTACT?

☐ YES ☐ NO ☐ N/A

DATE:

TIME:

RECEIVED BY (SIGNATURE)

SEAL INTACT?

☐ YES ☐ NO ☐ N/A

DATE:

TIME:

SPECIAL INSTRUCTIONS:

Custody Seal 3835

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY:

☐ BRE ☐ LABORATORY ☐ MANUFACTURER

METHOD OF SHIPMENT: Fed Ex

BILL OF LADING NO.: 4361927172

WHITE-FULLY EXECUT PY
YELLOW-RECEIVING L. TORY COPY
PINK-SAMPLERS' COPY/QA COPY

SAMPLING TEAM:

John G Webster Gerald Goode

RECEIVED FOR LABORATORY
Y (SIGNATURE)

DATE: 4/25/97

TIME: 10:00

No. 0094

QA/QC Data



Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW01-001
Lab Sample ID: F582-3
Matrix: AQ - Ground Water
Method: EPA 504.1
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB01846.D	1	04/25/97	NF	n/a	n/a	GAB66
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW01-001
Lab Sample ID: F582-3
Matrix: AQ - Ground Water
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	0.0050	0.0030	mg/l	1	05/02/97	05/08/97 JK	EPA 239.2

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001B
Lab Sample ID: F582-4
Matrix: AQ - Ground Water
Method: EPA 8100
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01449.D	1	04/25/97	NF	04/25/97	OP83	GIJ68
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	10	ug/l	
208-96-8	Acenaphthylene	ND	10	ug/l	
120-12-7	Anthracene	ND	10	ug/l	
56-55-3	Benzo(a)anthracene	ND	10	ug/l	
50-32-8	Benzo(a)pyrene	ND	10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l	
218-01-9	Chrysene	ND	10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l	
206-44-0	Fluoranthene	ND	10	ug/l	
86-73-7	Fluorene	ND	10	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l	
91-20-3	Naphthalene	ND	10	ug/l	
90-12-0	1-Methylnaphthalene	ND	10	ug/l	
91-57-6	2-Methylnaphthalene	ND	10	ug/l	
85-01-8	Phenanthrene	ND	10	ug/l	
129-00-0	Pyrene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	85%		26-116%
84-15-1	o-Terphenyl	110%		26-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001B
Lab Sample ID: F582-4
Matrix: AQ - Ground Water
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01593.D	1	05/02/97	NF	04/30/97	OP89	GIJ73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	ND	0.50	mg/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	81%		40-140%
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ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-MW03-001B		Date Sampled: 04/23/97
Lab Sample ID: F582-4		Date Received: 04/25/97
Matrix: AQ - Ground Water		Percent Solids: n/a
Method: EPA 601/602		
Project: Site G300 CTO 0027		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002009.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	1.4	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID: 300-MW03-001B
Lab Sample ID: F582-4
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002009.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	106%		75-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001B
Lab Sample ID: F582-4
Matrix: AQ - Ground Water
Method: EPA 504.1
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB01847.D	1	04/25/97	NF	n/a	n/a	GAB66
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001B
Lab Sample ID: F582-4
Matrix: AQ - Ground Water
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	<0.0030	0.0030	mg/l	1	05/02/97	05/08/97 JK	EPA 239.2

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW02-001		Date Sampled: 04/23/97	
Lab Sample ID: F582-5		Date Received: 04/25/97	
Matrix: AQ - Ground Water		Percent Solids: n/a	
Method: EPA 8100			
Project: Site G300 CTO 0027			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01450.D	1	04/25/97	NF	04/25/97	OP83	GU68
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	10	ug/l	
208-96-8	Acenaphthylene	ND	10	ug/l	
120-12-7	Anthracene	ND	10	ug/l	
56-55-3	Benzo(a)anthracene	ND	10	ug/l	
50-32-8	Benzo(a)pyrene	ND	10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l	
218-01-9	Chrysene	ND	10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l	
206-44-0	Fluoranthene	ND	10	ug/l	
86-73-7	Fluorene	ND	10	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l	
91-20-3	Naphthalene	ND	10	ug/l	
90-12-0	1-Methylnaphthalene	ND	10	ug/l	
91-57-6	2-Methylnaphthalene	ND	10	ug/l	
85-01-8	Phenanthrene	ND	10	ug/l	
129-00-0	Pyrene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	67%		26-116%
84-15-1	o-Terphenyl	94%		26-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW02-001
Lab Sample ID: F582-5
Matrix: AQ - Ground Water
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01587.D	1	05/02/97	NF	04/30/97	OP89	GU73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	0.846	0.50	mg/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	89%		40-140%
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ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-MW02-001
Lab Sample ID: F582-5
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002010.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene ^a	1.8	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane ^a	1.7	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 7

Client Sample ID: 300-MW02-001
Lab Sample ID: F582-5
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002010.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	108%		75-125%

(a) Confirmed by reanalysis on MS

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW02-001
Lab Sample ID: F582-5
Matrix: AQ - Ground Water
Method: EPA 504.1
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB01848.D	1	04/25/97	NF	n/a	n/a	GAB66
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW02-001
Lab Sample ID: F582-5
Matrix: AQ - Ground Water
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	0.0094	0.0030	mg/l	1	05/02/97	05/08/97 JK	EPA 239.2

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 2

Client Sample ID: TRIP BLANK
Lab Sample ID: F582-6
Matrix: AQ - Trip Blank Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/17/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002012.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	2.7	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID:	TRIP BLANK	Date Sampled:	04/17/97
Lab Sample ID:	F582-6	Date Received:	04/25/97
Matrix:	AQ - Trip Blank Water	Percent Solids:	n/a
Method:	EPA 601/602		
Project:	Site G300 CTO 0027		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002012.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	106%		75-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Brown & Root Environmental

REPORT TO ADDRESS: 455 Fairway Drive Suite 200

Deerfield Beach, Florida 33441

TELEPHONE: (305) 570-5885 FAX: (305) 570-5874

SITE MANAGER: Paul Colligan

PROJECT NAME: Site G300 CTO 0027

BRE PROJECT NO: 7540 CODE: -

P.O. NO.: 2049-7540-P97159

SHIPPED TO: AccuTest Laboratories PAGE 1 OF 1

Southeast, Inc.

Orlando, FL

ATTN: Harry Behzadi

(LABORATORY NAME, CITY)

CHAIN OF CUSTODY RECORD

SAMPLED BY (PRINT): John G Webster & Gerald F. Goode

SAMPLER SIGNATURE: John G Webster Gerald F. Goode

SAMPLE TYPE

COMP. GRAB

MATRIX

PRES. TYPE

PARAMETERS

FLA

Pb

Cd

Cr

Mn

Hg

Cu

Zn

Fe

Ni

Co

Mg

Al

Si

K

Na

Ca

Ba

Sr

P

S

Cl

Br

I

F

O

N

C

H

Total

Number of Containers

STANDARD TAT ☒ RUSH☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS

RESULTS DUE DATE: _____

COMMENTS:

Samples Iced

TOTAL NUMBER OF CONTAINERS

5 5 10 10 10 5 2 47

EMPTY BOTTLES RETURNED BY (SIGNATURE)

① [Signature]

RELINQUISHED BY (SIGNATURE)

③ [Signature]

RELINQUISHED BY (SIGNATURE)

⑤ [Signature]

SEAL INTACT?

YES NO N/A

DATE:

TIME:

SEAL INTACT?

YES NO N/A

DATE:

TIME:

SEAL INTACT?

YES NO N/A

DATE:

TIME:

EMPTY BOTTLES RECEIVED BY (SIGNATURE)

② [Signature]

RECEIVED BY (SIGNATURE)

④ [Signature]

RECEIVED BY (SIGNATURE)

⑥ [Signature]

SEAL INTACT?

YES NO N/A

DATE: 4/23/97

TIME: 9:00 AM

SEAL INTACT?

YES NO N/A

DATE:

TIME:

SEAL INTACT?

YES NO N/A

DATE:

TIME:

SPECIAL INSTRUCTIONS:

Custody Seal 3832

LABORATORY REMARKS:

SAMPLE CONTAINERS PRECLEANED BY:

☐ BRE ☐ LABORATORY ☐ MANUFACTURER

METHOD OF SHIPMENT: FedEx

BILL OF LADING NO.: 4361927172

WHITE-FULLY EXECUTED COPY

YELLOW-RECEIVING LABORATORY COPY

PINK-SAMPLERS' COPY/QA COPY

SAMPLER'S SITE MANAGER'S COPY

SAMPLING TEAM:

John G Webster Gerald Goode

RECEIVED FOR LABORATORY

BY (SIGNATURE)

DATE: 4/25/97

TIME: 10:00

No. 3202

QA/QC Data

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: F582
Account: BRFLTALL - Brown & Root Environmental
Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP332
Matrix Type: AQUEOUS

Methods: EPA 206.2, EPA 239.2
Units: mg/l

Prep Date: 05/02/97

Metal	RDL	IDL	MB raw	final
Arsenic	0.0050	.001	anr	
Lead	0.0030	.001	-0.00054	<0.0030

Associated samples MP332: F582-1, F582-2, F582-3, F582-4, F582-5

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: F582
 Account: BRFLTALL - Brown & Root Environmental
 Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP332
 Matrix Type: AQUEOUS

Methods: EPA 206.2, EPA 239.2
 Units: mg/l

Prep Date: 05/02/97 05/02/97

Metal	F589-1 Original MS	Spikelot MPFLPUR	% Rec	QC Limits	F589-1 Original DUP	RPD	QC Limits
Arsenic	anr						
Lead	0.0070	0.032	0.020	125.0N 74-123	0.0070	0.0073	0.0 0-12

Associated samples MP332: F582-1, F582-2, F582-3, F582-4, F582-5

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: F582
 Account: BRFLTALL - Brown & Root Environmental
 Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP332
 Matrix Type: AQUEOUS

Methods: EPA 206.2, EPA 239.2
 Units: mg/l

Prep Date: 05/02/97

Metal	BSP	Spikelet		QC
	Result	MPFLFUR	% Rec	Limits
Arsenic	anr			
Lead	0.022	0.020	110.0	80-120

Associated samples MP332: F582-1, F582-2, F582-3, F582-4, F582-5

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

Blank Spike Summary

Page 1 of 1

Job Number: F582

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83-BS	I01405.D	1	04/22/97	NF	04/22/97	OP83	GLJ66

The QC reported here applies to the following samples:

Method: EPA 610

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
83-32-9	Acenaphthene	50	48.9	98	27-113
208-96-8	Acenaphthylene	50	46.6	93	27-111
120-12-7	Anthracene	50	46.0	92	27-124
56-55-3	Benzo(a)anthracene	50	52.8	106	28-124
50-32-8	Benzo(a)pyrene	50	46.8	94	38-111
205-99-2	Benzo(b)fluoranthene	50	44.5	89	27-121
191-24-2	Benzo(g,h,i)perylene	50	53.7	107	27-115
207-08-9	Benzo(k)fluoranthene	50	44.7	89	25-123
218-01-9	Chrysene	50	53.6	107	29-131
53-70-3	Dibenzo(a,h)anthracene	50	53.0	106	22-114
206-44-0	Fluoranthene	50	46.9	94	28-123
86-73-7	Fluorene	50	47.7	95	28-118
193-39-5	Indeno(1,2,3-cd)pyrene	50	52.8	106	25-119
91-20-3	Naphthalene	50	42.0	84	28-109
90-12-0	1-Methylnaphthalene	50	43.1	86	25-115
91-57-6	2-Methylnaphthalene	50	45.7	91	25-115
85-01-8	Phenanthrene	50	45.8	92	28-121
129-00-0	Pyrene	50	47.4	95	28-122

CAS No.	Surrogate Recoveries	BSP	Limits
321-60-8	2-Fluorobiphenyl	97%	26-116%
84-15-1	o-Terphenyl	100%	26-116%

Blank Spike Summary

Page 1 of 1

Job Number: F582**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89-BS	I01590.D	1	05/02/97	NF	04/30/97	OP89	GLJ73

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH (C8-C40)	2	2.00	100	

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	89%	40-140%

Method Blank Summary

Page 1 of 1

Job Number: F582

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83-MB2	I01442.D	1	04/25/97	NF	04/25/97	OP83	GLJ68

The QC reported here applies to the following samples:

Method: EPA 610

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	Result	RDL	Units Q
83-32-9	Acenaphthene	ND	10	ug/l
208-96-8	Acenaphthylene	ND	10	ug/l
120-12-7	Anthracene	ND	10	ug/l
56-55-3	Benzo(a)anthracene	ND	10	ug/l
50-32-8	Benzo(a)pyrene	ND	10	ug/l
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l
218-01-9	Chrysene	ND	10	ug/l
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l
206-44-0	Fluoranthene	ND	10	ug/l
86-73-7	Fluorene	ND	10	ug/l
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l
91-20-3	Naphthalene	ND	10	ug/l
90-12-0	1-Methylnaphthalene	ND	10	ug/l
91-57-6	2-Methylnaphthalene	ND	10	ug/l
85-01-8	Phenanthrene	ND	10	ug/l
129-00-0	Pyrene	ND	10	ug/l

CAS No.	Surrogate Recoveries	Limits
321-60-8	2-Fluorobiphenyl	59% 26-116%
84-15-1	o-Terphenyl	98% 26-116%

Method Blank Summary

Page 1 of 1

Job Number: F582**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89-MB	I01582.D	1	05/02/97	NF	04/30/97	OP89	GLJ73

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	0.50	mg/l	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	73% 40-140%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: F582

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83-MS	I01403.D	1	04/22/97	NF	04/22/97	OP83	GLJ66
OP83-MSD	I01404.D	1	04/22/97	NF	04/22/97	OP83	GLJ66
F567-1	I01397.D	1	04/22/97	NF	04/22/97	OP83	GLJ66

The QC reported here applies to the following samples:

Method: EPA 610

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	F567-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		50	45.5	91	45.0	90	1	27-113/22
208-96-8	Acenaphthylene	ND		50	43.6	87	42.4	85	3	27-111/21
120-12-7	Anthracene	ND		50	42.2	84	43.3	87	2	27-124/24
56-55-3	Benzo(a)anthracene	ND		50	46.4	93	42.8	86	8	28-124/24
50-32-8	Benzo(a)pyrene	ND		50	42.6	85	42.2	84	1	38-111/22
205-99-2	Benzo(b)fluoranthene	ND		50	39.8	80	40.2	80	1	27-121/24
191-24-2	Benzo(g,h,i)perylene	ND		50	46.6	93	43.6	87	7	27-115/22
207-08-9	Benzo(k)fluoranthene	ND		50	39.8	80	40.7	81	2	25-123/25
218-01-9	Chrysene	ND		50	45.7	91	42.2	84	8	29-131/26
53-70-3	Dibenzo(a,h)anthracene	ND		50	45.4	91	43.0	86	5	22-114/23
206-44-0	Fluoranthene	ND		50	42.3	85	42.4	85	0	28-123/24
86-73-7	Fluorene	ND		50	43.5	87	43.1	86	1	28-118/23
193-39-5	Indeno(1,2,3-cd)pyrene	ND		50	45.7	91	43.1	86	6	25-119/23
91-20-3	Naphthalene	ND		50	41.1	82	39.0	78	5	28-109/20
90-12-0	1-Methylnaphthalene	ND		50	41.3	83	39.2	78	5	25-115/25
91-57-6	2-Methylnaphthalene	ND		50	43.9	88	41.6	83	5	25-115/25
85-01-8	Phenanthrene	ND		50	42.2	84	43.3	87	2	28-121/23
129-00-0	Pyrene	ND		50	42.8	86	42.6	85	0	28-122/24

CAS No.	Surrogate Recoveries	MS	MSD	F567-1	Limits
321-60-8	2-Fluorobiphenyl	87%	80%	76%	26-116%
84-15-1	o-Terphenyl	86%	87%	94%	26-116%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: F582**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89-MS	I01588.D	1	05/02/97	NF	04/30/97	OP89	GLJ73
OP89-MSD	I01589.D	1	05/02/97	NF	04/30/97	OP89	GLJ73
F582-5	I01587.D	1	05/02/97	NF	04/30/97	OP89	GLJ73

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	F582-5 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (C8-C40)	.846	2	2.99	107	2.78	97	7	

CAS No.	Surrogate Recoveries	MS	MSD	F582-5	Limits
84-15-1	o-Terphenyl	112%	108%	89%	40-140%

Blank Spike Summary

Page 1 of 1

Job Number: F582**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAB66-BS	AB01839.D	1	04/25/97	NF	n/a	n/a	GAB66

The QC reported here applies to the following samples:**Method:** EPA 504.1

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
106-93-4	1,2-Dibromoethane	0.25	0.26	104	70-130

Blank Spike Summary

Page 1 of 1

Job Number: F582**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEF50-BS	EF001982.D1		04/23/97	AW	n/a	n/a	GEF50

The QC reported here applies to the following samples:**Method:** EPA 601/602

F582-1, F582-2, F582-3, F582-4, F582-5, F582-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-25-2	Bromoform	10	8.2	82	50-150
75-27-4	Bromodichloromethane	10	8.8	88	50-150
56-23-5	Carbon tetrachloride	10	9.0	90	50-150
108-90-7	Chlorobenzene	20	16.5	83	50-150
67-66-3	Chloroform	10	9.7	97	50-150
10061-01-5	cis-1,3-Dichloropropene	10	8.3	83	50-150
124-48-1	Dibromochloromethane	10	8.9	89	50-150
75-34-3	1,1-Dichloroethane	10	8.5	85	50-150
107-06-2	1,2-Dichloroethane	10	8.5	85	50-150
75-35-4	1,1-Dichloroethene	10	8.2	82	50-150
156-60-5	trans-1,2-Dichloroethene	10	8.2	82	50-150
10061-02-6	trans-1,3-Dichloropropene	10	9.2	92	50-150
78-87-5	1,2-Dichloropropane	10	8.8	88	50-150
75-09-2	Methylene chloride	10	9.2	92	50-150
79-34-5	1,1,2,2-Tetrachloroethane	10	8.2	82	50-150
127-18-4	Tetrachloroethene	10	8.7	87	50-150
71-55-6	1,1,1-Trichloroethane	10	8.3	83	50-150
79-00-5	1,1,2-Trichloroethane	10	9.0	90	50-150
79-01-6	Trichloroethene	10	7.9	79	50-150
541-73-1	1,3-Dichlorobenzene	20	16.4	82	50-150
106-46-7	1,4-Dichlorobenzene	20	16.9	84	50-150
95-50-1	1,2-Dichlorobenzene	20	16.5	82	50-150
540-59-0	1,2-Dichloroethene (total)	10	8.2	82	50-150

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	102%	75-125%

Method Blank Summary

Page 1 of 1

Job Number: F582**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GAB66-MB	AB01838.D	1	04/25/97	NF	n/a	n/a	GAB66

The QC reported here applies to the following samples:

Method: EPA 504.1

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	Result	RDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

Method Blank Summary

Page 1 of 1

Job Number: F582

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEF50-MB3	EF001990.D1		04/24/97	AW	n/a	n/a	GEF50

The QC reported here applies to the following samples:

Method: EPA 601/602

F582-1, F582-2, F582-3, F582-4, F582-5, F582-6

CAS No.	Compound	Result	RDL	Units	Q
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
460-00-4	4-Bromofluorobenzene	99% 75-125%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: F582

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
F563-2MS	AB01842.D	1	04/25/97	NF	n/a	n/a	GAB66
F563-2MSD	AB01843.D	1	04/25/97	NF	n/a	n/a	GAB66
F563-2	AB01841.D	1	04/25/97	NF	n/a	n/a	GAB66

The QC reported here applies to the following samples:

Method: EPA 504.1

F582-1, F582-2, F582-3, F582-4, F582-5

CAS No.	Compound	F563-2 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
106-93-4	1,2-Dibromoethane	ND	0.25	0.25	100	0.26	104	4	74.4-121.6/

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: F582

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
F573-3MS	EF001978.D1		04/23/97	AW	n/a	n/a	GEF50
F573-3MSD	EF001980.D1		04/23/97	AW	n/a	n/a	GEF50
F573-3	EF001977.D1		04/23/97	AW	n/a	n/a	GEF50

The QC reported here applies to the following samples:

Method: EPA 601/602

F582-1, F582-2, F582-3, F582-4, F582-5, F582-6

CAS No.	Compound	F573-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
75-25-2	Bromoform	ND		10	7.7	77	7.6	76	1	34-126/23
75-27-4	Bromodichloromethane	ND		10	8.4	84	8.2	82	2	54-120/17
56-23-5	Carbon tetrachloride	ND		10	9.0	90	9.6	96	6	48-124/19
108-90-7	Chlorobenzene	ND		30	24.4	81	25.5	85	4	74-129/14
67-66-3	Chloroform	ND		10	8.85	88	9.98	100	1	48-125/19
10061-01-5	cis-1,3-Dichloropropene	ND		10	7.6	76	8.2	82	8	55-119/16
124-48-1	Dibromochloromethane	ND		10	8.1	81	8.4	84	4	57-131/19
75-34-3	1,1-Dichloroethane	ND		10	8.0	80	9.1	91	13	51-136/21
107-06-2	1,2-Dichloroethane	ND		10	8.8	88	9.9	99	12	50-144/23
75-35-4	1,1-Dichloroethene	ND		10	8.2	82	9.1	91	10	72-148/19
156-60-5	trans-1,2-Dichloroethene	ND		10	8.2	82	9.2	92	11	60-128/17
10061-02-6	trans-1,3-Dichloropropene	ND		10	7.8	78	8.6	86	10	49-121/18
78-87-5	1,2-Dichloropropane	ND		10	8.3	83	9.0	90	8	57-121/16
75-09-2	Methylene chloride	ND		10	9.5	95	9.9	99	4	58-110/13
79-34-5	1,1,2,2-Tetrachloroethane	ND		10	8.0	80	8.9	89	11	25-135/28
127-18-4	Tetrachloroethene	ND		10	8.1	81	9.2	92	13	54-127/18
71-55-6	1,1,1-Trichloroethane	ND		10	8.3	83	9.4	94	12	63-112/12
79-00-5	1,1,2-Trichloroethane	ND		10	8.1	81	8.6	86	6	49-133/21
79-01-6	Trichloroethene	15.3		10	20.5	52	21.3	60	4	33-170/34
541-73-1	1,3-Dichlorobenzene	ND		30	24.3	81	25.9	86	6	70-125/14
106-46-7	1,4-Dichlorobenzene	ND		30	25.2	84	25.4	85	1	73-127/14
95-50-1	1,2-Dichlorobenzene	ND		30	24.4	81	25.1	84	3	71-131/15
156-69-4	cis-1,2-Dichloroethene	1.6		10	8.4	68	9.4	78	11	50-150/30
540-59-0	1,2-Dichloroethene (total)	1.6	J	20	16.6	83	18.6	93	11	50-150/30

CAS No.	Surrogate Recoveries	MS	MSD	F573-3	Limits
460-00-4	4-Bromofluorobenzene	88%	99%	96%	75-125%

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: F581
Account: BRFLTALL - Brown & Root Environmental
Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP332
Matrix Type: AQUEOUS

Methods: EPA 206.2, EPA 239.2
Units: mg/l

Prep Date: 05/02/97

Metal	RDL	IDL	MB	
			raw	final
Arsenic	0.0050	.001	anr	
Lead	0.0030	.001	-0.00054	<0.0030

Associated samples MP332: F581-2

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

DRAFT Analysis Report - Not for Release

Comments:

COMMA Due Date: 05/13/97 V6012PPL

Page 2 of 2

Client Sample IDMW-2

Lab Sample ID: F616-2

Date Sampled05/06/97

Matrix: AQ - Ground Water

Date Received05/06/97

Method: EPA 601/602

Percent Solidsn/a

Project:

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002183.D	1	05/08/97	AW	n/a	n/a	GEF54
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	107%		75-125%
98-08-8	aaa-Trifluorotoluene	95%		75-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

DRAFT Analysis Report - Not for Release

Comments:

COMMA Due Date: 05/13/97 V6012PPL

Page 1 of 2

Client Sample IDMW-2

Lab Sample ID: F616-2

Matrix: AQ - Ground Water

Method: EPA 601/602

Project:

Date Sampled: 05/06/97

Date Received: 05/06/97

Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002183.D	1	05/08/97	AW	n/a	n/a	GEF54
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

DRAFT Analysis Report - Not for Release**Comments:****COMMA Due Date:** 05/07/97 V601STD

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Client Sample IDINFLUENT**Lab Sample ID:** F617-2**Matrix:** AQ - Ground Water**Method:** EPA 601/602**Project:****Date Sampled:**05/06/97**Date Received:**05/06/97**Percent Solids:**n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EF002179.D	500	05/08/97	AW	n/a	n/a	GEF54
Run #2							

VOA Halogenated List

CAS No.	Compound	Result	RDL	Units	Q
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(a) Dilution required due to matrix interference.

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

DRAFT Analysis Report - Not for Release

Comments:

COMMA Due Date: 05/07/97 V601STD

Page 1 of 2

Client Sample IDENFLUENT

Lab Sample ID: F617-2

Date Sampled 05/06/97

Matrix: AQ - Ground Water

Date Received 05/06/97

Method: EPA 601/602

Percent Solids n/a

Project:

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EF002179.D	500	05/08/97	AW	n/a	n/a	GEF54
Run #2							

VOA Halogenated List

CAS No.	Compound	Result	RDL	Units Q
75-25-2	Bromoform	ND	500	ug/l
75-27-4	Bromodichloromethane	ND	500	ug/l
74-83-9	Bromomethane	ND	500	ug/l
56-23-5	Carbon tetrachloride	ND	500	ug/l
108-90-7	Chlorobenzene	ND	500	ug/l
75-00-3	Chloroethane	ND	500	ug/l
67-66-3	Chloroform	ND	500	ug/l
74-87-3	Chloromethane	ND	500	ug/l
10061-01-5	cis-1,3-Dichloropropene	ND	500	ug/l
124-48-1	Dibromochloromethane	ND	500	ug/l
75-71-8	Dichlorodifluoromethane	ND	500	ug/l
75-34-3	1,1-Dichloroethane	ND	500	ug/l
107-06-2	1,2-Dichloroethane	ND	500	ug/l
75-35-4	1,1-Dichloroethene	ND	500	ug/l
156-60-5	trans-1,2-Dichloroethene	ND	500	ug/l
10061-02-6	trans-1,3-Dichloropropene	ND	500	ug/l
78-87-5	1,2-Dichloropropane	ND	500	ug/l
75-09-2	Methylene chloride	ND	2500	ug/l
1634-04-4	Methyl Tert Butyl Ether	ND	500	ug/l
79-34-5	1,1,2,2-Tetrachloroethane	ND	500	ug/l
127-18-4	Tetrachloroethene	ND	500	ug/l
71-55-6	1,1,1-Trichloroethane	ND	500	ug/l
79-00-5	1,1,2-Trichloroethane	ND	500	ug/l
79-01-6	Trichloroethene	10600	500	ug/l
75-69-4	Trichlorofluoromethane	ND	500	ug/l
75-01-4	Vinyl chloride	ND	500	ug/l
541-73-1	1,3-Dichlorobenzene	ND	500	ug/l
106-46-7	1,4-Dichlorobenzene	ND	500	ug/l
95-50-1	1,2-Dichlorobenzene	ND	500	ug/l
156-69-4	cis-1,2-Dichloroethene	ND	500	ug/l
540-59-0	1,2-Dichloroethene (total)	ND	1000	ug/l

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	96%		75-125%
98-08-8	aaa-Trifluorotoluene	96%		75-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
F573-3MS	EF001978.D1		04/23/97	AW	n/a	n/a	GEF50
F573-3MSD	EF001980.D1		04/23/97	AW	n/a	n/a	GEF50
F573-3	EF001977.D1		04/23/97	AW	n/a	n/a	GEF50

The QC reported here applies to the following samples:

Method: EPA 601/602

F581-2, F581-5

CAS No.	Compound	F573-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
75-25-2	Bromoform	ND		10	7.7	77	7.6	76	1	34-126/23
75-27-4	Bromodichloromethane	ND		10	8.4	84	8.2	82	2	54-120/17
56-23-5	Carbon tetrachloride	ND		10	9.0	90	9.6	96	6	48-124/19
108-90-7	Chlorobenzene	ND		30	24.4	81	25.5	85	4	74-129/14
67-66-3	Chloroform	ND		10	8.85	88	9.98	100	1	48-125/19
10061-01-5	cis-1,3-Dichloropropene	ND		10	7.6	76	8.2	82	8	55-119/16
124-48-1	Dibromochloromethane	ND		10	8.1	81	8.4	84	4	57-131/19
75-34-3	1,1-Dichloroethane	ND		10	8.0	80	9.1	91	13	51-136/21
107-06-2	1,2-Dichloroethane	ND		10	8.8	88	9.9	99	12	50-144/23
75-35-4	1,1-Dichloroethene	ND		10	8.2	82	9.1	91	10	72-148/19
156-60-5	trans-1,2-Dichloroethene	ND		10	8.2	82	9.2	92	11	60-128/17
10061-02-6	trans-1,3-Dichloropropene	ND		10	7.8	78	8.6	86	10	49-121/18
78-87-5	1,2-Dichloropropane	ND		10	8.3	83	9.0	90	8	57-121/16
75-09-2	Methylene chloride	ND		10	9.5	95	9.9	99	4	58-110/13
79-34-5	1,1,2,2-Tetrachloroethane	ND		10	8.0	80	8.9	89	11	25-135/28
127-18-4	Tetrachloroethene	ND		10	8.1	81	9.2	92	13	54-127/18
71-55-6	1,1,1-Trichloroethane	ND		10	8.3	83	9.4	94	12	63-112/12
79-00-5	1,1,2-Trichloroethane	ND		10	8.1	81	8.6	86	6	49-133/21
79-01-6	Trichloroethene	15.3		10	20.5	52	21.3	60	4	33-170/34
541-73-1	1,3-Dichlorobenzene	ND		30	24.3	81	25.9	86	6	70-125/14
106-46-7	1,4-Dichlorobenzene	ND		30	25.2	84	25.4	85	1	73-127/14
95-50-1	1,2-Dichlorobenzene	ND		30	24.4	81	25.1	84	3	71-131/15
156-69-4	cis-1,2-Dichloroethene	1.6		10	8.4	68	9.4	78	11	50-150/30
540-59-0	1,2-Dichloroethene (total)	1.6	J	20	16.6	83	18.6	93	11	50-150/30

CAS No.	Surrogate Recoveries	MS	MSD	F573-3	Limits
460-00-4	4-Bromofluorobenzene	88%	99%	96%	75-125%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
F542-5MS	EF001998.D1		04/24/97	AW	n/a	n/a	GEF51
F542-5MSD	EF002000.D1		04/24/97	AW	n/a	n/a	GEF51
F542-5	EF001996.D1		04/24/97	AW	n/a	n/a	GEF51

The QC reported here applies to the following samples:

Method: SW846 8010/8020

F581-1, F581-3, F581-4

CAS No.	Compound	F542-5 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		10	16.6	166*	16.1	161*	3	50-150/30
75-25-2	Bromoform	ND		10	9.6	96	9.0	90	6	50-150/30
75-27-4	Bromodichloromethane	ND		10	9.7	97	10	100	3	50-150/30
56-23-5	Carbon tetrachloride	ND		10	9.7	97	9.4	94	3	50-150/30
108-90-7	Chlorobenzene	ND		10	23.1	231*	23.0	230*	0	50-150/30
67-66-3	Chloroform	ND		10	15.1	151*	11.1	111	30	50-150/30
10061-01-5	cis-1,3-Dichloropropene	ND		10	7.8	78	7.5	75	4	50-150/30
124-48-1	Dibromochloromethane	ND		10	10.0	100	9.5	95	5	50-150/30
75-34-3	1,1-Dichloroethane	ND		10	10.4	104	10.0	100	4	50-150/30
107-06-2	1,2-Dichloroethane	ND		10	10.7	107	9.9	99	8	50-150/30
75-35-4	1,1-Dichloroethene	ND		10	10.4	104	9.9	99	5	50-150/30
156-60-5	trans-1,2-Dichloroethene	ND		10	8.2	82	7.6	76	8	50-150/30
10061-02-6	trans-1,3-Dichloropropene	ND		10	7.6	76	7.6	76	0	50-150/30
78-87-5	1,2-Dichloropropane	ND		10	10.1	101	9.7	97	4	50-150/30
100-41-4	Ethylbenzene	ND		10	15.7	157*	15.6	156*	1	50-150/30
75-09-2	Methylene chloride	ND		10	12.3	123	12.1	121	2	50-150/30
79-34-5	1,1,2,2-Tetrachloroethane	ND		10	10.8	108	9.3	93	15	50-150/30
127-18-4	Tetrachloroethene	ND		10	7.7	77	7.5	75	3	50-150/30
108-88-3	Toluene	ND		10	17.3	173*	16.5	165*	5	50-150/30
71-55-6	1,1,1-Trichloroethane	ND		10	10.5	105	9.8	98	7	50-150/30
79-00-5	1,1,2-Trichloroethane	ND		10	10.7	107	10.2	102	5	50-150/30
79-01-6	Trichloroethene	ND		10	8.0	80	7.9	79	1	50-150/30
541-73-1	1,3-Dichlorobenzene	ND		10	19.1	191*	20.7	207*	8	50-150/30
106-46-7	1,4-Dichlorobenzene	ND		10	19.0	190*	20.7	207*	8	50-150/30
95-50-1	1,2-Dichlorobenzene	ND		10	19.3	193*	20.8	208*	7	50-150/30
1330-20-7	Xylenes (total)	ND		30	48.1	160*	46.8	156*	3	50-150/30
156-69-4	cis-1,2-Dichloroethene	ND		30	8.1	27*	7.6	25*	6	50-150/30

CAS No.	Surrogate Recoveries	MS	MSD	F542-5	Limits
460-00-4	4-Bromofluorobenzene	94%	102%	98%	50-150%

Method Blank Summary

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Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

(a)	Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
	GEF51-MB	EF002005.D1		04/25/97	AW	n/a	n/a	GEF51

The QC reported here applies to the following samples:

Method: SW846 8010/8020

F581-1, F581-3, F581-4

CAS No.	Surrogate Recoveries	Limits
74-97-5	Bromochloromethane	34.5ug/kg -%
460-00-4	4-Bromofluorobenzene	117% 50-150%
460-00-4	4-Bromofluorobenzene	94% 50-150%

(a) SAMPLE NOT YET APPROVED BY LAB. DO NOT REPORT.

Method Blank Summary

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Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

(a)	Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
	GEF51-MB	EF002005.D1		04/25/97	AW	n/a	n/a	GEF51

The QC reported here applies to the following samples:

Method: SW846 8010/8020

F581-1, F581-3, F581-4

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/kg	
75-25-2	Bromoform	ND	1.0	ug/kg	
75-27-4	Bromodichloromethane	ND	1.0	ug/kg	
74-83-9	Bromomethane	ND	1.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	1.0	ug/kg	
108-90-7	Chlorobenzene	ND	1.0	ug/kg	
75-00-3	Chloroethane	ND	1.0	ug/kg	
67-66-3	Chloroform	ND	1.0	ug/kg	
74-87-3	Chloromethane	ND	1.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/kg	
124-48-1	Dibromochloromethane	ND	1.0	ug/kg	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/kg	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	ug/kg	
75-09-2	Methylene chloride	4.2	5.0	ug/kg	J
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/kg	
127-18-4	Tetrachloroethene	ND	1.0	ug/kg	
108-88-3	Toluene	ND	1.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/kg	
79-01-6	Trichloroethene	ND	1.0	ug/kg	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/kg	
75-01-4	Vinyl chloride	ND	1.0	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/kg	
1330-20-7	Xylenes (total)	ND	3.0	ug/kg	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/kg	

Method Blank Summary

Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEF50-MB3	EF001990.D1		04/24/97	AW	n/a	n/a	GEF50

The QC reported here applies to the following samples:

Method: EPA 601/602

F581-2, F581-5

CAS No.	Compound	Result	RDL	Units	Q
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
460-00-4	4-Bromofluorobenzene	99% 75-125%

Blank Spike Summary

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Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEF51-BS	EF001987.D1		04/23/97	AW	n/a	n/a	GEF51

The QC reported here applies to the following samples:

Method: SW846 8010/8020

F581-1, F581-3, F581-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	10	8.7	87	50-150
75-25-2	Bromoform	10	9.1	91	50-150
75-27-4	Bromodichloromethane	10	10.0	100	50-150
56-23-5	Carbon tetrachloride	10	10.8	108	50-150
108-90-7	Chlorobenzene	10	18.6	186*	50-150
67-66-3	Chloroform	10	12.3	123	50-150
10061-01-5	cis-1,3-Dichloropropene	10	8.7	87	50-150
124-48-1	Dibromochloromethane	10	9.6	96	50-150
75-34-3	1,1-Dichloroethane	10	9.8	98	50-150
107-06-2	1,2-Dichloroethane	10	9.5	95	50-150
75-35-4	1,1-Dichloroethene	10	10.6	106	50-150
156-60-5	trans-1,2-Dichloroethene	10	8.8	88	50-150
10061-02-6	trans-1,3-Dichloropropene	10	8.3	83	50-150
78-87-5	1,2-Dichloropropane	10	10.2	102	50-150
100-41-4	Ethylbenzene	10	9.7	97	50-150
75-09-2	Methylene chloride	10	10.6	106	50-150
79-34-5	1,1,2,2-Tetrachloroethane	10	8.9	89	50-150
127-18-4	Tetrachloroethene	10	9.0	90	50-150
108-88-3	Toluene	10	9.5	95	50-150
71-55-6	1,1,1-Trichloroethane	10	10.3	103	50-150
79-00-5	1,1,2-Trichloroethane	10	9.7	97	50-150
79-01-6	Trichloroethene	10	9.8	98	50-150
541-73-1	1,3-Dichlorobenzene	10	18.4	184*	50-150
106-46-7	1,4-Dichlorobenzene	10	18.5	185*	50-150
95-50-1	1,2-Dichlorobenzene	10	17.8	178*	50-150
1330-20-7	Xylenes (total)	30	27.4	91	50-150

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	108%	50-150%

Blank Spike Summary

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Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GEF50-BS	EF001982.D1		04/23/97	AW	n/a	n/a	GEF50

The QC reported here applies to the following samples:

Method: EPA 601/602

F581-2, F581-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-25-2	Bromoform	10	8.2	82	50-150
75-27-4	Bromodichloromethane	10	8.8	88	50-150
56-23-5	Carbon tetrachloride	10	9.0	90	50-150
108-90-7	Chlorobenzene	20	16.5	83	50-150
67-66-3	Chloroform	10	9.7	97	50-150
10061-01-5	cis-1,3-Dichloropropene	10	8.3	83	50-150
124-48-1	Dibromochloromethane	10	8.9	89	50-150
75-34-3	1,1-Dichloroethane	10	8.5	85	50-150
107-06-2	1,2-Dichloroethane	10	8.5	85	50-150
75-35-4	1,1-Dichloroethene	10	8.2	82	50-150
156-60-5	trans-1,2-Dichloroethene	10	8.2	82	50-150
10061-02-6	trans-1,3-Dichloropropene	10	9.2	92	50-150
78-87-5	1,2-Dichloropropane	10	8.8	88	50-150
75-09-2	Methylene chloride	10	9.2	92	50-150
79-34-5	1,1,2,2-Tetrachloroethane	10	8.2	82	50-150
127-18-4	Tetrachloroethene	10	8.7	87	50-150
71-55-6	1,1,1-Trichloroethane	10	8.3	83	50-150
79-00-5	1,1,2-Trichloroethane	10	9.0	90	50-150
79-01-6	Trichloroethene	10	7.9	79	50-150
541-73-1	1,3-Dichlorobenzene	20	16.4	82	50-150
106-46-7	1,4-Dichlorobenzene	20	16.9	84	50-150
95-50-1	1,2-Dichlorobenzene	20	16.5	82	50-150
540-59-0	1,2-Dichloroethene (total)	10	8.2	82	50-150

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	102%	75-125%

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89-MS	I01588.D	1	05/02/97	NF	04/30/97	OP89	GLJ73
OP89-MSD	I01589.D	1	05/02/97	NF	04/30/97	OP89	GLJ73
F582-5	I01587.D	1	05/02/97	NF	04/30/97	OP89	GLJ73

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F581-2

CAS No.	Compound	F582-5 mg/l	Spike Q mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH (C8-C40)	.846	2	2.99	107	2.78	97	7	

CAS No.	Surrogate Recoveries	MS	MSD	F582-5	Limits
84-15-1	o-Terphenyl	112%	108%	89%	40-140%

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85-MS	I01474.D	1	04/29/97	NF	04/28/97	OP85	GLJ69
OP85-MSD	I01475.D	1	04/29/97	NF	04/28/97	OP85	GLJ69
F581-1	I01473.D	1	04/28/97	NF	04/28/97	OP85	GLJ69

The QC reported here applies to the following samples:

Method: EPA 8100

F581-1, F581-3, F581-4

CAS No.	Compound	F581-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		848	636	75	621	73	2	32-99/17
208-96-8	Acenaphthylene	ND		848	616	73	601	71	2	26-90/16
120-12-7	Anthracene	ND		848	585	69	611	72	4	32-106/19
56-55-3	Benzo(a)anthracene	ND		848	633	75	634	75	0	35-127/23
50-32-8	Benzo(a)pyrene	ND		848	599	71	597	70	0	21-97/14
205-99-2	Benzo(b)fluoranthene	ND		848	666	78	651	77	2	40-130/23
191-24-2	Benzo(g,h,i)perylene	ND		848	621	73	668	79	7	36-141/26
207-08-9	Benzo(k)fluoranthene	ND		848	659	78	650	77	1	47-141/24
218-01-9	Chrysene	ND		848	634	75	634	75	0	37-120/23
53-70-3	Dibenzo(a,h)anthracene	ND		848	582	69	622	73	7	44-132/22
206-44-0	Fluoranthene	ND		848	668	79	687	81	3	33-125/23
86-73-7	Fluorene	ND		848	654	77	635	75	3	35-108/18
193-39-5	Indeno(1,2,3-cd)pyrene	ND		848	616	73	671	79	8	53-144/23
91-20-3	Naphthalene	ND		848	574	68	554	65	4	20-96/14
90-12-0	1-Methylnaphthalene	ND		848	568	67	550	65	3	35-120/25
91-57-6	2-Methylnaphthalene	ND		848	604	71	584	69	3	35-120/25
85-01-8	Phenanthrene	ND		848	627	74	658	78	5	37-117/20
129-00-0	Pyrene	ND		848	636	75	648	76	2	37-120/21

CAS No.	Surrogate Recoveries	MS	MSD	F581-1	Limits
321-60-8	2-Fluorobiphenyl	74%	71%	65%	35-120%
84-15-1	o-Terphenyl	75%	78%	74%	35-120%

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83-MS	I01403.D	1	04/22/97	NF	04/22/97	OP83	GLJ66
OP83-MSD	I01404.D	1	04/22/97	NF	04/22/97	OP83	GLJ66
F567-1	I01397.D	1	04/22/97	NF	04/22/97	OP83	GLJ66

The QC reported here applies to the following samples:

Method: EPA 610

F581-2

CAS No.	Compound	F567-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		50	45.5	91	45.0	90	1	27-113/22
208-96-8	Acenaphthylene	ND		50	43.6	87	42.4	85	3	27-111/21
120-12-7	Anthracene	ND		50	42.2	84	43.3	87	2	27-124/24
56-55-3	Benzo(a)anthracene	ND		50	46.4	93	42.8	86	8	28-124/24
50-32-8	Benzo(a)pyrene	ND		50	42.6	85	42.2	84	1	38-111/22
205-99-2	Benzo(b)fluoranthene	ND		50	39.8	80	40.2	80	1	27-121/24
191-24-2	Benzo(g,h,i)perylene	ND		50	46.6	93	43.6	87	7	27-115/22
207-08-9	Benzo(k)fluoranthene	ND		50	39.8	80	40.7	81	2	25-123/25
218-01-9	Chrysene	ND		50	45.7	91	42.2	84	8	29-131/26
53-70-3	Dibenzo(a,h)anthracene	ND		50	45.4	91	43.0	86	5	22-114/22
206-44-0	Fluoranthene	ND		50	42.3	85	42.4	85	0	28-123/24
86-73-7	Fluorene	ND		50	43.5	87	43.1	86	1	28-118/23
193-39-5	Indeno(1,2,3-cd)pyrene	ND		50	45.7	91	43.1	86	6	25-119/23
91-20-3	Naphthalene	ND		50	41.1	82	39.0	78	5	28-109/20
90-12-0	1-Methylnaphthalene	ND		50	41.3	83	39.2	78	5	25-115/25
91-57-6	2-Methylnaphthalene	ND		50	43.9	88	41.6	83	5	25-115/25
85-01-8	Phenanthrene	ND		50	42.2	84	43.3	87	2	28-121/23
129-00-0	Pyrene	ND		50	42.8	86	42.6	85	0	28-122/24

CAS No.	Surrogate Recoveries	MS	MSD	F567-1	Limits
321-60-8	2-Fluorobiphenyl	87%	80%	76%	26-116%
84-15-1	o-Terphenyl	86%	87%	94%	26-116%

Matrix Spike/Matrix Spike Duplicate Summary

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Job Number: F581**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74-MS	I01336.D	1	04/09/97	NF	04/07/97	OP74	GLJ62
OP74-MSD	I01337.D	1	04/09/97	NF	04/07/97	OP74	GLJ62
F503-1	I01335.D	1	04/09/97	NF	04/07/97	OP74	GLJ62

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F581-1, F581-3, F581-4

CAS No.	Compound	F503-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH (C8-C40)	13.4		38.7	51.9	99	62.9	128	19	

CAS No.	Surrogate Recoveries	MS	MSD	F503-1	Limits
84-15-1	o-Terphenyl	62%	61%	53%	40-140%

Method Blank Summary

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Job Number: F581**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89-MB	I01582.D	1	05/02/97	NF	04/30/97	OP89	GLJ73

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F581-2

CAS No.	Compound	Result	RDL	Units Q
	TPH (C8-C40)	ND	0.50	mg/l

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	73% 40-140%

Method Blank Summary

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Job Number: F581**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85-MB	I01465.D	1	04/28/97	NF	04/28/97	OP85	GLJ69

The QC reported here applies to the following samples:

Method: EPA 8100

F581-1, F581-3, F581-4

CAS No.	Compound	Result	RDL	Units Q
83-32-9	Acenaphthene	ND	330	ug/kg
208-96-8	Acenaphthylene	ND	330	ug/kg
120-12-7	Anthracene	ND	330	ug/kg
56-55-3	Benzo(a)anthracene	ND	330	ug/kg
50-32-8	Benzo(a)pyrene	ND	330	ug/kg
205-99-2	Benzo(b)fluoranthene	ND	330	ug/kg
191-24-2	Benzo(g,h,i)perylene	ND	330	ug/kg
207-08-9	Benzo(k)fluoranthene	ND	330	ug/kg
218-01-9	Chrysene	ND	330	ug/kg
53-70-3	Dibenzo(a,h)anthracene	ND	330	ug/kg
206-44-0	Fluoranthene	ND	330	ug/kg
86-73-7	Fluorene	ND	330	ug/kg
193-39-5	Indeno(1,2,3-cd)pyrene	ND	330	ug/kg
91-20-3	Naphthalene	ND	330	ug/kg
90-12-0	1-Methylnaphthalene	ND	330	ug/kg
91-57-6	2-Methylnaphthalene	ND	330	ug/kg
85-01-8	Phenanthrene	ND	330	ug/kg
129-00-0	Pyrene	ND	330	ug/kg

CAS No.	Surrogate Recoveries	Limits
321-60-8	2-Fluorobiphenyl	78% 35-120%
84-15-1	o-Terphenyl	87% 35-120%

Method Blank Summary

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Job Number: F581**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83-MB2	I01442.D	1	04/25/97	NF	04/25/97	OP83	GLJ68

The QC reported here applies to the following samples:

Method: EPA 610

F581-2

CAS No.	Compound	Result	RDL	Units Q
83-32-9	Acenaphthene	ND	10	ug/l
208-96-8	Acenaphthylene	ND	10	ug/l
120-12-7	Anthracene	ND	10	ug/l
56-55-3	Benzo(a)anthracene	ND	10	ug/l
50-32-8	Benzo(a)pyrene	ND	10	ug/l
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l
218-01-9	Chrysene	ND	10	ug/l
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l
206-44-0	Fluoranthene	ND	10	ug/l
86-73-7	Fluorene	ND	10	ug/l
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l
91-20-3	Naphthalene	ND	10	ug/l
90-12-0	1-Methylnaphthalene	ND	10	ug/l
91-57-6	2-Methylnaphthalene	ND	10	ug/l
85-01-8	Phenanthrene	ND	10	ug/l
129-00-0	Pyrene	ND	10	ug/l

CAS No.	Surrogate Recoveries	Limits
321-60-8	2-Fluorobiphenyl	59% 26-116%
84-15-1	o-Terphenyl	98% 26-116%

Method Blank Summary

Page 1 of 1

Job Number: F581**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74-MB2	I01576.D	1	05/02/97	NF	05/01/97	OP74	GLJ73

The QC reported here applies to the following samples:**Method:** FLORIDA-PRO

F581-1, F581-3, F581-4

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	8.3	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	51% 40-140%

Blank Spike Summary

Page 1 of 1

Job Number: F581**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP89-BS	I01590.D	1	05/02/97	NF	04/30/97	OP89	GLJ73

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F581-2

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH (C8-C40)	2	2.00	100	

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	89%	40-140%

Blank Spike Summary

Page 1 of 1

Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP85-BS	I01476.D	1	04/29/97	NF	04/28/97	OP85	GLJ69

The QC reported here applies to the following samples:

Method: EPA 8100

F581-1, F581-3, F581-4

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	830	636	77	
208-96-8	Acenaphthylene	830	614	74	
120-12-7	Anthracene	830	619	74	
56-55-3	Benzo(a)anthracene	830	662	80	
50-32-8	Benzo(a)pyrene	830	584	70	
205-99-2	Benzo(b)fluoranthene	830	690	83	
191-24-2	Benzo(g,h,i)perylene	830	610	73	
207-08-9	Benzo(k)fluoranthene	830	675	81	
218-01-9	Chrysene	830	667	80	
53-70-3	Dibenzo(a,h)anthracene	830	623	75	
206-44-0	Fluoranthene	830	693	83	
86-73-7	Fluorene	830	674	81	
193-39-5	Indeno(1,2,3-cd)pyrene	830	627	76	
91-20-3	Naphthalene	830	555	67	
90-12-0	1-Methylnaphthalene	830	552	66	
91-57-6	2-Methylnaphthalene	830	600	72	
85-01-8	Phenanthrene	830	687	83	
129-00-0	Pyrene	830	690	83	

CAS No.	Surrogate Recoveries	BSP	Limits
321-60-8	2-Fluorobiphenyl	74%	35-120%
84-15-1	o-Terphenyl	86%	35-120%

Blank Spike Summary

Page 1 of 1

Job Number: F581

Account: BRFLTALL Brown & Root Environmental

Project: Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP83-BS	I01405.D	1	04/22/97	NF	04/22/97	OP83	GLJ66

The QC reported here applies to the following samples:

Method: EPA 610

F581-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
83-32-9	Acenaphthene	50	48.9	98	27-113
208-96-8	Acenaphthylene	50	46.6	93	27-111
120-12-7	Anthracene	50	46.0	92	27-124
56-55-3	Benzo(a)anthracene	50	52.8	106	28-124
50-32-8	Benzo(a)pyrene	50	46.8	94	38-111
205-99-2	Benzo(b)fluoranthene	50	44.5	89	27-121
191-24-2	Benzo(g,h,i)perylene	50	53.7	107	27-115
207-08-9	Benzo(k)fluoranthene	50	44.7	89	25-123
218-01-9	Chrysene	50	53.6	107	29-131
53-70-3	Dibenzo(a,h)anthracene	50	53.0	106	22-114
206-44-0	Fluoranthene	50	46.9	94	28-123
86-73-7	Fluorene	50	47.7	95	28-118
193-39-5	Indeno(1,2,3-cd)pyrene	50	52.8	106	25-119
91-20-3	Naphthalene	50	42.0	84	28-109
90-12-0	1-Methylnaphthalene	50	43.1	86	25-115
91-57-6	2-Methylnaphthalene	50	45.7	91	25-115
85-01-8	Phenanthrene	50	45.8	92	28-121
129-00-0	Pyrene	50	47.4	95	28-122

CAS No.	Surrogate Recoveries	BSP	Limits
321-60-8	2-Fluorobiphenyl	97%	26-116%
84-15-1	o-Terphenyl	100%	26-116%

Blank Spike Summary

Page 1 of 1

Job Number: F581**Account:** BRFLTALL Brown & Root Environmental**Project:** Site G300 CTO 0027

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74-BS	I01333.D	1	04/08/97	NF	04/07/97	OP74	GLJ62

The QC reported here applies to the following samples:

Method: FLORIDA-PRO

F581-1, F581-3, F581-4

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH (C8-C40)	33.3	36.6	110	

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	81%	40-140%

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: F581
 Account: BRFLTALL - Brown & Root Environmental
 Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP340
 Matrix Type: AQUEOUS

Methods: SW846 7060, SW846 7421
 Units: mg/kg

Prep Date: 05/05/97

Metal	BSP Result	Spikelot MPFLFUR	% Rec	QC Limits
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Arsenic anr

Lead

Associated samples MP340: F581-1, F581-3, F581-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: F581
 Account: BRFLTALL - Brown & Root Environmental
 Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP340
 Matrix Type: AQUEOUS

Methods: SW846 7060, SW846 7421
 Units: mg/kg

Prep Date: 05/05/97 05/05/97

Metal	F606-1 Original DUP	RPD	QC Limits	F606-1 Original MS	Spikelet MPFLFUR & Rec	QC Limits
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Arsenic anr

Lead

Associated samples MP340: F581-1, F581-3, F581-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits
 (N) Matrix Spike Rec. outside of QC limits
 (anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: F581
Account: BRFLTALL - Brown & Root Environmental
Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP340
Matrix Type: AQUEOUS

Methods: SW846 7060, SW846 7421
Units: mg/kg

Prep Date: 05/05/97

Metal	RDL	IDL	MB raw	final
Arsenic	0.50	.1	anr	
Lead	0.32	.107		

Associated samples MP340: F581-1, F581-3, F581-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: F581
 Account: BRFLTALL - Brown & Root Environmental
 Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP332
 Matrix Type: AQUEOUS

Methods: EPA 206.2, EPA 239.2
 Units: mg/l

Prep Date: 05/02/97

Metal	BSP	Spikelot	QC	
	Result	MPFLFUR	% Rec	Limits
Arsenic	anr			
Lead	0.022	0.020	110.0	80-120

Associated samples MP332: F581-2

Results < IDL are shown as zero for calculation purposes
 (*) Outside of QC limits
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: F581
 Account: BRFLTALL - Brown & Root Environmental
 Project: BRFLTALL453 - Site G300 CTO 0027

QC Batch ID: MP332
 Matrix Type: AQUEOUS

Methods: EPA 206.2, EPA 239.2
 Units: mg/l

Prep Date: 05/02/97 05/02/97

Metal	F589-1 Original MS	Spikelot MPFLFUR	QC Limits	F589-1 Original DUP	RPD	QC Limits
Arsenic	anr					
Lead	0.0070 0.032	0.020	125.0M 74-123	0.0070 0.0073	0.0	0-12

Associated samples MP332: F581-2

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(anr) Analyte not requested

APPENDIX K

FIELD MEASUREMENTS AND SAMPLING FORMS



GROUNDWATER LEVEL MEASUREMENT SHEET

Page 1 of 1

PROJECT NAME: CTO 0027

LOCATION: Panama City

PROJECT NUMBER: 7540

MEASURING DEVICE: Electronic wave probe

PERSONNEL: Gerald Goode

ADJUSTMENT FACTOR: 1.4

DATE: 3/21/97

REMARKS: *None*

WEATHER CONDITIONS: overcast 70°F

[illegible]

*Measurements to nearest 0.01 foot.

Signature(s):

Arnold Hood

ATTACHMENT C-1
EXAMPLE GROUNDWATER LEVEL MEASUREMENT SHEET



GROUNDWATER LEVEL MEASUREMENT SHEET

Page 1 of 1

PROJECT NAME: CTO0027

LOCATION: 300

PROJECT NUMBER: 7540

MEASURING DEVICE: *water level indicator*

PERSONNEL: John Webster / Gerald Goode

ADJUSTMENT FACTOR:

DATE: 4/23/97

REMARKS:

WEATHER CONDITIONS: Overcast, slight breeze, 65°F

[illegible]

*Measurements to nearest 0.01 feet.

Signature(s):

Arnold Good

Brown & Root Environmental SAMPLING LOG Page 1 of 1

BRE Project No: 7540 Date: 3/21/99 Sampler(s): Hank Storch

Client Site ID: CTO 0027 Facility Address: Paines City

Weather: Overcast 70°F Sampling Method: Teflon Bailor Y ☒ Other ☐ SOP Cleaning Y ☐ N

Comments: Well development: Purged 2 gallons from well using peristaltic pump and tygon tubing. Used new section of tygon tubing for down to pump

GROUNDWATER SYSTEM PERFORMANCE AND QUALITY CONTROL SAMPLES											TEST PARAMETERS			
A	B	C	D	E	Sample ID	Time	Source	pH	Temp.	So. Cond.	Test Method	Container Type	Purpose Type	
							GWS Influent				A			
							GWS Effluent				B			
							Equipment Blank				C			
							Equipment Blank				D			
							Tng Blank				E			
							Duplicate I	I						
							Duplicate I	I						

GROUNDWATER SAMPLES										TD	Csg Dia (in)	DTW	Purge Vol
			PZ-1	9:50		7.01	19.5	174.7	10'	1"	8.73	2 gal	
				10:00		6.97	19.7	170.3					
				10:10		7.01	19.5	165.7					

Water is usually clear after development

Total depth of well measured at 10' 6 1/2".

UNITS: TEMPERATURE = DEGREES CELSIUS/pH = STANDARD UNITS/SPECIFIC CONDUCTANCE = UMHOS/CM

WELL CASING VOLUMES (GALLONS/FT OF SATURATED CASING, FOR 5x PURGE) 1.25" = 0.32 / 2" = 0.32 / 4" = 3.27 / 6" = 7.35

NOTE: A 3x PURGE IS OK FOR: 4" = 1.96 / 6" = 4.41, PROVIDED 3 CONSISTENT REPEAT FIELD METER READINGS ARE OBSERVED



Samplers	Number of samples	Number of samples	Number of samples
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

Facility Address:

Sampling Method: Teflon Bailor Y ~~N~~ Other

SOP Cleaning ☒ Y ☐ N

Comments: Upell development: Purged 2 gallons from well using peristaltic pump and Tygon tubing. Used new section of Tygon tubing

GROUP WATER SAMPLES								TD	Csg Dia (in)	DTW	Purge Vol	
			PZ-3	9:10		7.01	20.3	204	14'	1"	8.64	2 gal
				9:20		7.00	19.6	199.9				
				9:35		6.99	19.2	191				

Water Visually Clean in the development

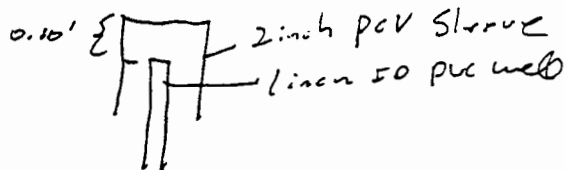
Total depth of well measured at 14' 6 1/2"

UNITS: TEMPERATURE = DEGREES CELSIUS/pH = STANDARD UNITS/SPECIFIC CONDUCTANCE = UMHOS/CM

WELL CASING VOLUMES (GALLONS/FT OF SATURATED CASING, FOR 5x PURGE) $1.25' = 0.32 / 2' = 0.32 / 4' = 3.27 / 6' = 7.35$

NOTE: A 3x PURGE IS OK FOR: $4" = 1.96 / 5" = 4.41$, PROVIDED 3 CONSISTENT REPEAT FIELD METER READINGS ARE OBSERVED

Depth to groundwater measured
from north side of top of
sleeve casing (2-inch pvc)



BRE Project No: 7540

Date: 4/23/57

Sampler(s):

Client Site ID: CTO 0027

Facility Address: Site 300 Coastal Systems Station

Weather: overcast 65°F

Sampling Method: Teflon Bailor ☒ Other Residuals

SOP Cleaning (Y) N

Comments:

Pump & Tygon Tubing

GROUNDWATER SYSTEM PERFORMANCE AND QUALITY CONTROL SAMPLES

TEST PARAMETERS

A	B	C	D	E	Sample ID	Time	Source	pH	Temp.	So. Cond.	Test Method	Container Type	Preserv. Type
							QW's Inflow				A		
							QW's Effluent				B		
							Equipment Blank				C		
							Equipment Blank				D		
							Tap Water				E		
							Quadrant 1						
							Quadrant 1						

GROUNDEWATER SAMPLES

[illegible]

UNITS: TEMPERATURE = DEGREES CELSIUS/°C = STANDARD UNITS/SPECIFIC CONDUCTANCE = UMHO/CM

WELL CASING VOLUMES (GALLONS/FT OF SATURATED CASING, FOR 5x PURGE) $1.25' = 0.32 / 3' = 0.32 / 4' = 1.27 / 6' = 7.35$

NOTE: A 3x PURGE IS OK FOR: 4" = 1.96 : 5" = 4.41 PROVIDED 3 CONSISTENT REPEAT FIELD METER READINGS ARE OBSERVED

APPENDIX L

SLUG TEST DATA AND HYDRAULIC CONDUCTIVITY CALCULATIONS

HYDRAULIC CONDUCTIVITY GEOMETRIC MEAN

The Bouwer and Rice methodology for partially penetrating wells in unconfined aquifers was utilized to calculate hydraulic conductivity values for the three wells (Bouwer, 1989; Bouwer and Rice, 1976). Calculations were performed using the Aqtesolv™ aquifer characterization program (Duffield and Rumbaugh, 1991). The slug test data and Aqtesolv™ results are included in this appendix. Hydraulic conductivity (K) values in the aquifers immediately surrounding the monitoring wells were calculated to be:

$$\text{PCY-300-MW02} = 0.005074 \text{ feet/min} = 2.58 \times 10^{-3} \text{ cm/sec}$$

$$\text{PCY-300-MW03} = 0.01451 \text{ feet/min} = 7.37 \times 10^{-3} \text{ cm/sec}$$

$$\text{PCY-300-MW04} = 0.004891 \text{ feet/min} = 2.48 \times 10^{-3} \text{ cm/sec}$$

The average hydraulic conductivity was determined by calculating the geometric mean of the three values as follows:

$$\begin{aligned} &= e^{\left[\frac{\ln x_1 + \ln x_2 + \dots + \ln x_n}{n} \right]} \\ &= e^{\left[\frac{\ln x_1 + \ln x_2 + \ln x_3}{3} \right]} \\ &= e^{\left[\frac{\ln(0.005074 \text{ ft/min}) + \ln(0.01451 \text{ ft/min}) + \ln(0.004891 \text{ ft/min})}{3} \right]} \\ &= e^{\left[\frac{-14.84 \text{ ft/min}}{3} \right]} \\ &= 0.007114 \text{ ft/min} \\ &= 3.61 \times 10^{-3} \text{ cm / sec} \\ &= 10.24 \text{ ft/day} \end{aligned}$$

SLUG TEST METHOD FOR UNCONFINED AQUIFERS

REFERENCE: Bouwer, H. and R. C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

SOLUTION:

$$\ln s_o - \ln s_t = \frac{2 K L t}{r_c^2 \ln(r_o/r_w)}$$

where:

s_o = initial drawdown in well due to instantaneous removal of water from well [L]

s_t = drawdown in well at time t [L]

L = length of well screen [L]

r_c = radius of well casing [L]

$\ln(r_o/r_w)$ = empirical "shape factor" determined from tables provided in Bouwer and Rice (1976)

r_o = equivalent radius over which head loss occurs [L]

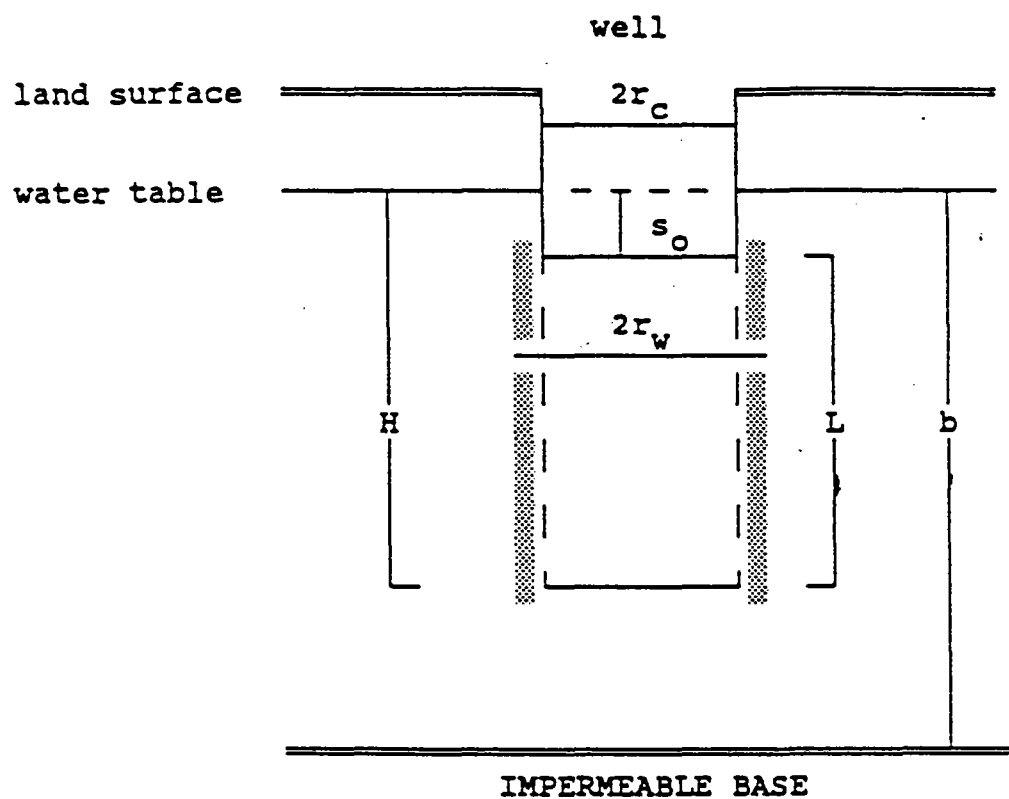
r_w = radius of well (including gravel pack) [L]

H = static height of water in well [L]

b = saturated thickness of aquifer

SLUG TEST METHOD FOR UNCONFINED AQUIFERS (continued)

DEFINITION OF TERMS:



SE1000B
Environmental Logger
06/28 13:22

Unit# 00061 Test# 0
PCY-300-MW02

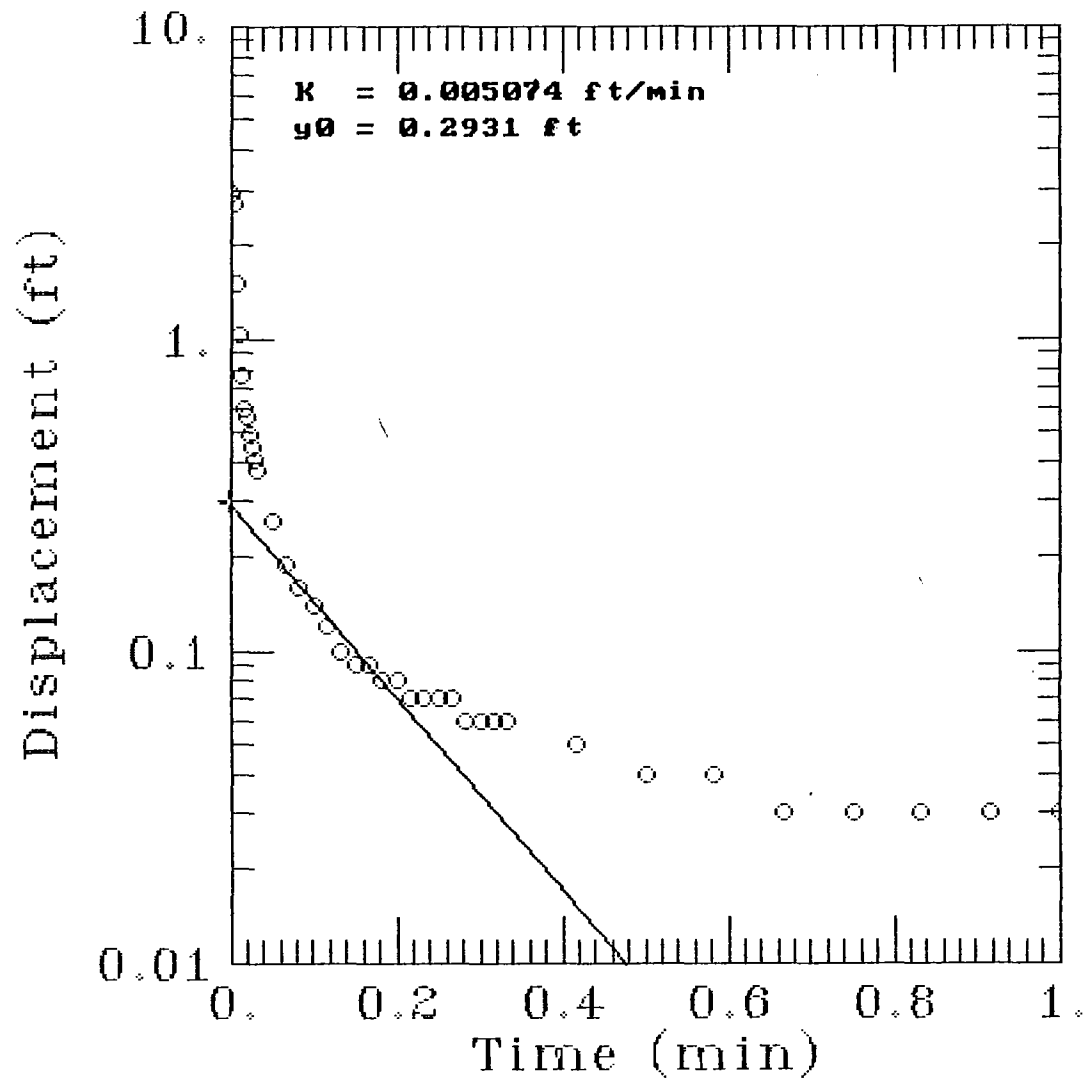
INPUT 1: Level (F) TOC

Reference 8.83
Scale factor 14.90
Offset - 0.13

Step# 0 04/25 09:31

Elapsed Time	Value
0.0000	11.75
0.0003	11.54
0.0006	10.34
0.0009	9.66
0.0013	9.60
0.0016	9.43
0.0020	9.39
0.0023	9.33
0.0026	9.28
0.0030	9.24
0.0033	9.21
0.0036	9.09
0.0040	9.00
0.0043	8.99
0.0046	8.97
0.0050	8.95
0.0053	8.93
0.0056	8.92
0.0060	8.91
0.0063	8.90
0.0066	8.89
0.0070	8.88
0.0073	8.87
0.0076	8.86
0.0080	8.85
0.0083	8.84
0.0086	8.83
0.0090	8.82
0.0093	8.81
0.0096	8.80
0.0100	8.79
0.0103	8.78
0.0106	8.77
0.0110	8.76
0.0113	8.75
0.0116	8.74
0.0120	8.73
0.0123	8.72
0.0126	8.71
0.0130	8.70
0.0133	8.69
0.0136	8.68
0.0140	8.67
0.0143	8.66
0.0146	8.65
0.0150	8.64
0.0153	8.63
0.0156	8.62
0.0160	8.61
0.0163	8.60
0.0166	8.59
0.0170	8.58
0.0173	8.57
0.0176	8.56
0.0180	8.55
0.0183	8.54
0.0186	8.53
0.0190	8.52
0.0193	8.51
0.0196	8.50
0.0200	8.49
0.0203	8.48
0.0206	8.47
0.0210	8.46
0.0213	8.45
0.0216	8.44
0.0220	8.43
0.0223	8.42
0.0226	8.41
0.0230	8.40
0.0233	8.39
0.0236	8.38
0.0240	8.37
0.0243	8.36
0.0246	8.35
0.0250	8.34
0.0253	8.33
0.0256	8.32
0.0260	8.31
0.0263	8.30
0.0266	8.29
0.0270	8.28
0.0273	8.27
0.0276	8.26
0.0280	8.25
0.0283	8.24
0.0286	8.23
0.0290	8.22
0.0293	8.21
0.0296	8.20
0.0300	8.19
0.0303	8.18
0.0306	8.17
0.0310	8.16
0.0313	8.15
0.0316	8.14
0.0320	8.13
0.0323	8.12
0.0326	8.11
0.0330	8.10
0.0333	8.09
0.0336	8.08
0.0340	8.07
0.0343	8.06
0.0346	8.05
0.0350	8.04
0.0353	8.03
0.0356	8.02
0.0360	8.01
0.0363	8.00
0.0366	7.99
0.0370	7.98
0.0373	7.97
0.0376	7.96
0.0380	7.95
0.0383	7.94
0.0386	7.93
0.0390	7.92
0.0393	7.91
0.0396	7.90
0.0400	7.89
0.0403	7.88
0.0406	7.87
0.0410	7.86
0.0413	7.85
0.0416	7.84
0.0420	7.83
0.0423	7.82
0.0426	7.81
0.0430	7.80
0.0433	7.79
0.0436	7.78
0.0440	7.77
0.0443	7.76
0.0446	7.75
0.0450	7.74
0.0453	7.73
0.0456	7.72
0.0460	7.71
0.0463	7.70
0.0466	7.69
0.0470	7.68
0.0473	7.67
0.0476	7.66
0.0480	7.65
0.0483	7.64
0.0486	7.63
0.0490	7.62
0.0493	7.61
0.0496	7.60
0.0500	7.59
0.0503	7.58
0.0506	7.57
0.0510	7.56
0.0513	7.55
0.0516	7.54
0.0520	7.53
0.0523	7.52
0.0526	7.51
0.0530	7.50
0.0533	7.49
0.0536	7.48
0.0540	7.47
0.0543	7.46
0.0546	7.45
0.0550	7.44
0.0553	7.43
0.0556	7.42
0.0560	7.41
0.0563	7.40
0.0566	7.39
0.0570	7.38
0.0573	7.37
0.0576	7.36
0.0580	7.35
0.0583	7.34
0.0586	7.33
0.0590	7.32
0.0593	7.31
0.0596	7.30
0.0600	7.29
0.0603	7.28
0.0606	7.27
0.0610	7.26
0.0613	7.25
0.0616	7.24
0.0620	7.23
0.0623	7.22
0.0626	7.21
0.0630	7.20
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0.0636	7.18
0.0640	7.17
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0.0646	7.15
0.0650	7.14
0.0653	7.13
0.0656	7.12
0.0660	7.11
0.0663	7.10
0.0666	7.09
0.0670	7.08
0.0673	7.07
0.0676	7.06
0.0680	7.05
0.0683	7.04
0.0686	7.03
0.0690	7.02
0.0693	7.01
0.0696	7.00
0.0700	6.99
0.0703	6.98
0.0706	6.97
0.0710	6.96
0.0713	6.95
0.0716	6.94
0.0720	6.93
0.0723	6.92
0.0726	6.91
0.0730	6.90
0.0733	6.89
0.0736	6.88
0.0740	6.87
0.0743	6.86
0.0746	6.85
0.0750	6.84
0.0753	6.83
0.0756	6.82
0.0760	6.81
0.0763	6.80
0.0766	6.79
0.0770	6.78
0.0773	6.77
0.0776	6.76
0.0780	6.75
0.0783	6.74
0.0786	6.73
0.0790	6.72
0.0793	6.71
0.0796	6.70
0.0800	6.69
0.0803	6.68
0.0806	6.67
0.0810	6.66
0.0813	6.65
0.0816	6.64
0.0820	6.63
0.0823	6.62
0.0826	6.61
0.0830	6.60
0.0833	6.59
0.0836	6.58
0.0840	6.57
0.0843	6.56
0.0846	6.55
0.0850	6.54
0.0853	6.53
0.0856	6.52
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0.0863	6.50
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0.0870	6.48
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0.1076	5.86
0.1080	5.85
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0.1086	5.83
0.1090	5.82
0.1093	5.81
0.1096	5.80
0.1100	5.79
0.1103	5.78
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0.1110	5.76
0.1113	5.75
0.1116	5.74
0.1120	5.73
0.1123	5.72
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0.1133	5.69
0.1136	5.68
0.1140	5.67
0.1143	5.66
0.1146	5.65
0.1150	5.64
0.1153	5.63
0.1156	5.62
0.1160	5.61
0.1163	5.60
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0.1170	5.58
0.1173	5.57
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0.1183	5.54
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0.1196	5.50
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0.1243	5.36
0.1246	5.35
0.1250	5.34
0.1253	5.33
0.1256	5.32
0.1260	5.31
0.1263	5.30
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0.1276	5.26
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0.1286	5.23
0.1290	5.22
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0.1316	5.14
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0.1323	5.12
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0.1336	5.08
0.1340	5.07
0.1343	5.06
0.1346	5.05
0.1350	5.04
0.1353	5.03
0.1356	5.02
0.1360	5.01
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0.1390	4.92
0.1393	4.91
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0.1400	4.89
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0.1456	4.72
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0.1466	4.69
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0.1480	4.65
0.1483	4.64
0.1486	4.63
0.1490	4.62
0.1493	4.61
0.1496	4.60
0.1500	4.59
0.1503	4.58
0.1506	4.57
0.1510	4.56
0.1513	4.55
0.1516	4.54
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0.1523	4.52
0.1526	4.51
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0.1536	4.48
0.1540	4.47
0.1543	4.46
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0.1553	4.43
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0.1560	4.41
0.1563	4.40
0.1566	4.39
0.1570	4.38
0.1573	4.37
0.1576	4.36
0.1580	4.35
0.1583	4.34
0.1586	4.33
0.1590	4.32
0.1593	4.31
0.1596	4.30
0.1600	4.29
0.1603	4.28
0.1606	4.27
0.1610	4.26
0.1613	4.25
0.1616	4.24
0.1620	4.23
0.1623	4.22
0.1626	4.21
0.1630	4.20
0.1633	4.19
0.1636	4.18
0.1640	4.17
0.1643	4.16
0.1646	4.15
0.1650	4.14
0.1653	4.13
0.1656	4.12
0.1660	4.11
0.1663	4.10
0.1666	4.09
0.1670	4.08
0.1673	4.07
0.	

PCY-300-MW02



AQTESOLV



GERAGHTY
& MILLER, INC.



Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

06/28/97

16:03:01

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TEST DESCRIPTION

=====

Data set..... G300MW02.DAT
Data set title..... PCY-300-MW02

Knowns and Constants:

No. of data points.....	67		
Radius of well casing.....	0.083		
Radius of well.....	0.333		
Aquifer saturated thickness.....	48		
Well screen length.....	10		
Static height of water in well.....	8.83		
Log(Re/Rw).....	2.083		
A, B, C.....	2.445,	0.398,	0.000

=====

ANALYTICAL METHOD

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Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM VISUAL CURVE MATCHING

=====

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	1.7121E-004
y0 =	0.0000E+000

TYPE CURVE DATA

K = 5.49772E-003
y0 = 2.98104E-001

Time	Drawdown	Time	Drawdown	Time	Drawdown
-----	-----	-----	-----	-----	-----
0.000E+000	2.981E-001	1.000E+000	1.401E-004		

TYPE CURVE DATA

K = 5.07411E-003
y0 = 2.93066E-001

Time	Drawdown	Time	Drawdown	Time	Drawdown
-----	-----	-----	-----	-----	-----
0.000E+000	2.931E-001	1.000E+000	2.485E-004		

SE1000B
Environmental Logger
06/28 13:18

Unit# 00061 Test# 2
PCY-300-MW03

INPUT 1: Level (F) TOC

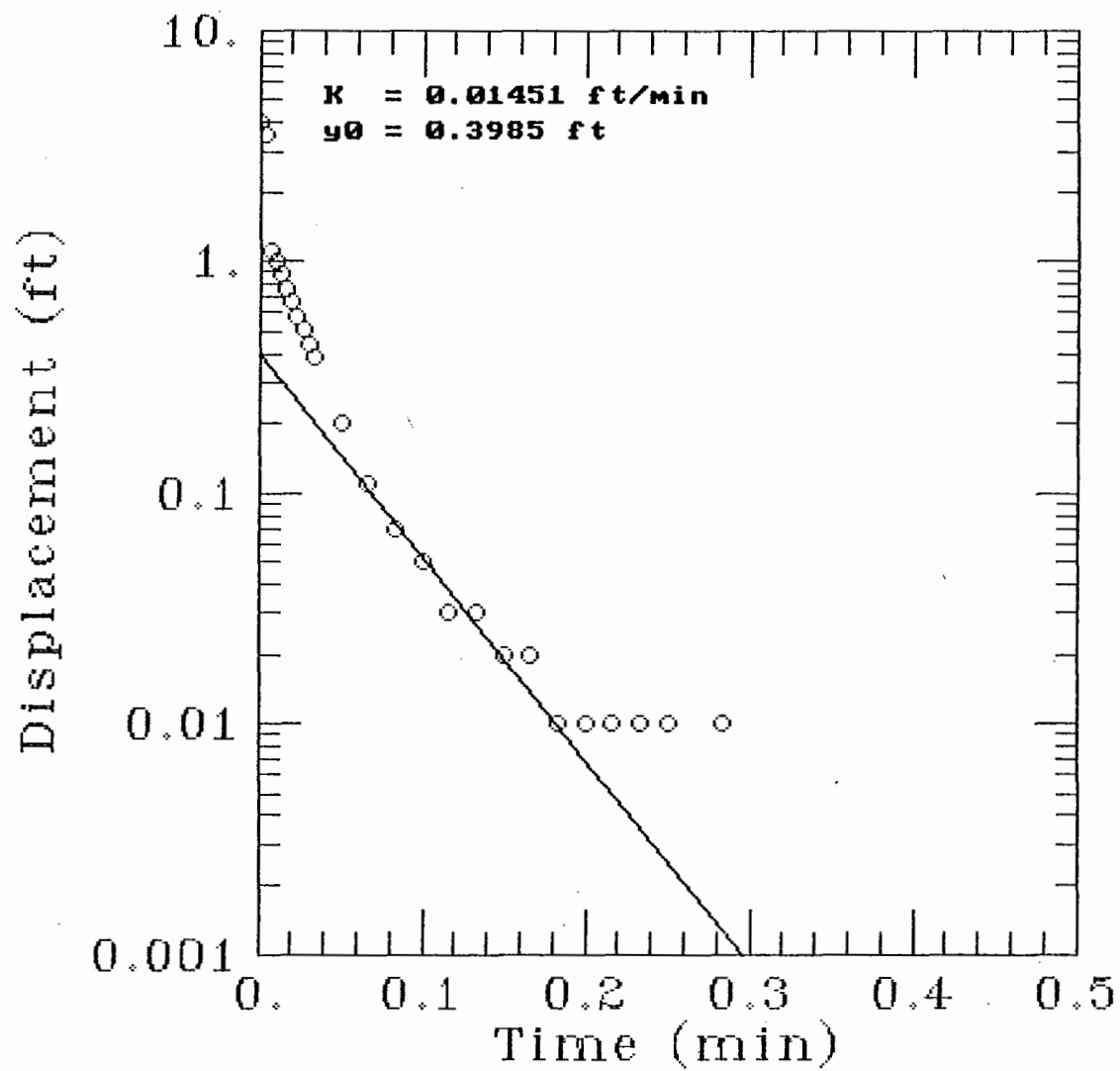
Reference 8.94
Scale factor 14.90
Offset - 0.13

Step# 0 04/25 10:32

Elapsed Time Value


0.0000	12.92
0.0033	12.51
0.0066	10.06
0.0099	9.94
0.0133	9.33
0.0166	9.71
0.0200	9.61
0.0233	9.52
0.0266	9.42
0.0300	9.38
0.0333	9.33
0.0366	9.4
0.0400	9.00
0.0433	9.15
0.0466	9.00
0.0500	9.7
0.0533	9.7
0.0566	9.6
0.0600	9.5
0.0633	9.5
0.0666	9.5
0.0700	9.4
0.0733	9.5
0.0766	9.4
0.0800	9.4
0.0833	9.4
0.0866	9.4
0.0900	9.4
0.0933	9.4
0.0966	9.4
0.1000	9.4
0.1033	9.4
0.1066	9.4
0.1100	9.4
0.1133	9.4
0.1166	9.4
0.1200	9.4
0.1233	9.4
0.1266	9.4
0.1300	9.4
0.1333	9.4
0.1366	9.4
0.1400	9.4
0.1433	9.4
0.1466	9.4
0.1500	9.4
0.1533	9.4
0.1566	9.4
0.1600	9.4
0.1633	9.4
0.1666	9.4
0.1700	9.4
0.1733	9.4
0.1766	9.4
0.1800	9.4
0.1833	9.4
0.1866	9.4
0.1900	9.4
0.1933	9.4
0.1966	9.4
0.2000	9.4
0.2033	9.4
0.2066	9.4
0.2100	9.4
0.2133	9.4
0.2166	9.4
0.2200	9.4
0.2233	9.4
0.2266	9.4
0.2300	9.4
0.2333	9.4
0.2366	9.4
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0.2433	9.4
0.2466	9.4
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0.2833	9.4
0.2866	9.4
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0.2933	9.4
0.2966	9.4
0.3000	9.4
0.3033	9.4
0.3066	9.4
0.3100	9.4
0.3133	9.4
0.3166	9.4
0.3200	9.4
0.3233	9.4
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0.3433	9.4
0.3466	9.4
0.3500	9.4
0.3533	9.4
0.3566	9.4
0.3600	9.4
0.3633	9.4
0.3666	9.4
0.3700	9.4
0.3733	9.4
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0.3833	9.4
0.3866	9.4
0.3900	9.4
0.3933	9.4
0.3966	9.4
0.4000	9.4
0.4033	9.4
0.4066	9.4
0.4100	9.4
0.4133	9.4
0.4166	9.4
0.4200	9.4
0.4233	9.4
0.4266	9.4
0.4300	9.4
0.4333	9.4
0.4366	9.4
0.4400	9.4
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0.4566	9.4
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0.4633	9.4
0.4666	9.4
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0.4733	9.4
0.4766	9.4
0.4800	9.4
0.4833	9.4
0.4866	9.4
0.4900	9.4
0.4933	9.4
0.4966	9.4
0.5000	9.4
0.5033	9.4
0.5066	9.4
0.5100	9.4
0.5133	9.4
0.5166	9.4
0.5200	9.4
0.5233	9.4
0.5266	9.4
0.5300	9.4
0.5333	9.4
0.5366	9.4
0.5400	9.4
0.5433	9.4
0.5466	9.4
0.5500	9.4
0.5533	9.4
0.5566	9.4
0.5600	9.4
0.5633	9.4
0.5666	9.4
0.5700	9.4
0.5733	9.4
0.5766	9.4
0.5800	9.4
0.5833	9.4
0.5866	9.4
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0.5933	9.4
0.5966	9.4
0.6000	9.4
0.6033	9.4
0.6066	9.4
0.6100	9.4
0.6133	9.4
0.6166	9.4
0.6200	9.4
0.6233	9.4
0.6266	9.4
0.6300	9.4
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0.6366	9.4
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0.6433	9.4
0.6466	9.4
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0.6533	9.4
0.6566	9.4
0.6600	9.4
0.6633	9.4
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0.7200	9.4
0.7233	9.4
0.7266	9.4
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0.7400	9.4
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0.7466	9.4
0.7500	9.4
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0.7566	9.4
0.7600	9.4
0.7633	9.4
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0.7766	9.4
0.7800	9.4
0.7833	9.4
0.7866	9.4
0.7900	9.4
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0.7966	9.4
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0.8033	9.4
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0.9933	9.4
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1.0000	9.4

PCY-300-MW03



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 Modeling Group

[illegible]

16:29:48

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 10

```
Data set..... G300MW03.DAT
Data set title..... PCY-300-MW03
```

Knowns and Constants:

No. of data points.....	24		
Radius of well casing.....	0.083		
Radius of well.....	0.333		
Aquifer saturated thickness.....	48		
Well screen length.....	10		
Static height of water in well.....	8.94		
Log(Re/Rw).....	2.088		
A, B, C.....	2.445,	0.398,	0.000

00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
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Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

VISUAL MATCH PARAMETER ESTIMATES

```

      Estimate
      K  =  1.4465E-002
      y0 =  0.0000E+000

```

[illegible]

TYPE CURVE DATA

```

K      = 1.45114E-002
Y0     = 3.98452E-001

```

Time	Drawdown	Time	Drawdown	Time	Drawdown
0.000E+000	3.985E-001	5.000E-001	1.660E-005		

SE1000B
Environmental Logger
06/28 13:20

Unit# 00061 Test# 1
PCY-300-MW04

INPUT 1: Level (F) TOC

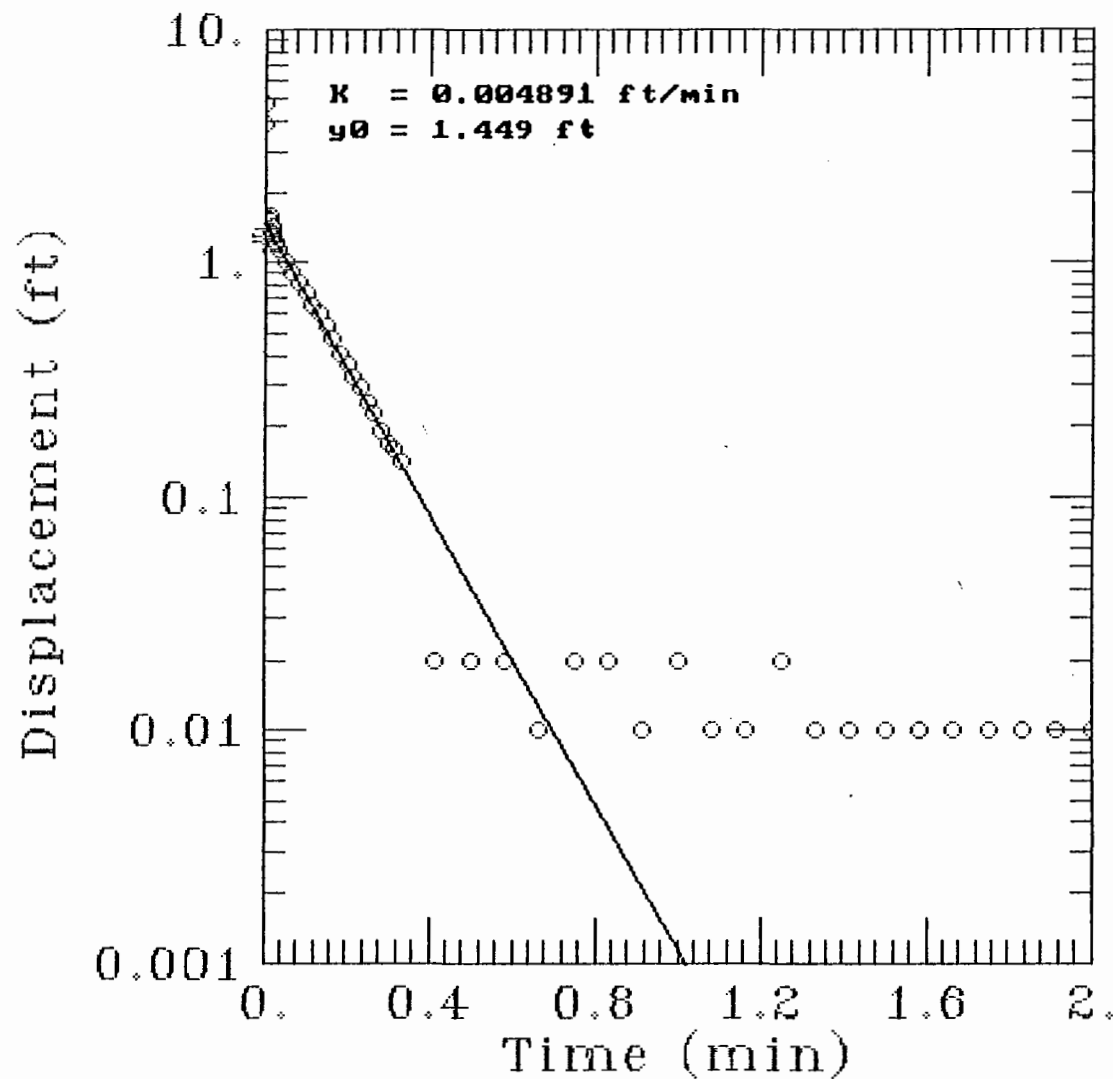
```
Reference      7.29
Scale factor   14.90
Offset         - 0.13
```

Step# 0 04/25 10:06

Elapsed Time	Value
--------------	-------

[illegible]

PCY-300-MW04



AQTESOLV



GERAGHTY
& MILLER, INC.



Modeling Group

A Q T E S O L V R E S U L T S
Version 1.10

06/28/97

16:22:06

=====

TEST DESCRIPTION

Data set..... G300MW04.DAT
Data set title..... PCY-300-MW04

Knowns and Constants:

No. of data points.....	66		
Radius of well casing.....	0.083		
Radius of well.....	0.333		
Aquifer saturated thickness.....	48		
Well screen length.....	10		
Static height of water in well.....	7.29		
Log(Re/Rw).....	1.994		
A, B, C.....	2.445,	0.398,	0.000

=====

ANALYTICAL METHOD

Bouwer-Rice (Unconfined Aquifer Slug Test)

=====

RESULTS FROM VISUAL CURVE MATCHING

VISUAL MATCH PARAMETER ESTIMATES

	Estimate
K =	4.8639E-003
y0 =	0.0000E+000

=====

TYPE CURVE DATA

K = 4.89120E-003
y0 = 1.44856E+000

Time	Drawdown	Time	Drawdown	Time	Drawdown
-----	-----	-----	-----	-----	-----
0.000E+000	1.449E+000	2.000E+000	9.457E-007		

APPENDIX M

GROUNDWATER GRADIENT, GROUNDWATER FLOW, AND TRANSMISSIVITY CALCULATIONS

GROUNDWATER FLOW GRADIENT

The groundwater flow gradient was determined using the following equation:

$$i = \frac{h_1 - h_2}{d}$$

where:

i = the hydraulic gradient

h_1 = the water elevation at point 1

h_2 = the water elevation at point 2

d = the distance between point 1 and point 2

The distance and groundwater elevations were obtained from Figure 3-1.

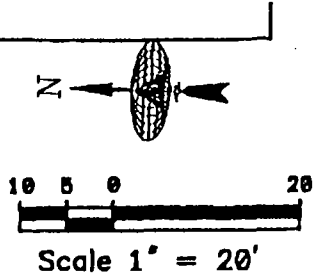
April 23, 1997

The gradient across the site was calculated after constructing groundwater contours from the April 23, 1997, depth to water data, determining the perpendicular distance between two of these contours, and utilizing the following calculation:

$$i = \frac{1.63 \text{ ft} - 1.30 \text{ ft}}{47 \text{ ft}}$$

$$i = \frac{0.33 \text{ ft}}{47 \text{ ft}}$$

$$i = 0.01 \text{ ft/ft}$$



$$\Delta H = 0.30 \text{ Ft.}$$

$$d = 47 \text{ Ft.}$$

$$\frac{\Delta H}{d} = \frac{0.30 \text{ Ft.}}{47 \text{ Ft.}} = -0.01$$

DEEP OCEAN ENGINEERING PRESSURE BUILDING

LEGEND

⊕ MONITORING WELL
PCY-300-MW01

● PIEZOMETER
PZ-1

(1.45) GROUNDWATER ELEVATION

—1.40— GROUNDWATER CONTOUR

→ GROUNDWATER FLOW DIRECTION

⊕
PCY-300-MW02
(1.21)

HVAC

HVAC

METAL
BUILDING

CANOPY

FORMER LOCATION OF
2500 GAL. FUEL OIL TANK

UNDERGROUND ELECTRIC

GAS LINE

SIDEWALK

PZ-1
(1.31)

PCY-300-MW01
(1.45)

1.60

PZ-2
(1.62)

PCY-300-MW04
(1.65)

1.30

1.40

47 Ft.

PZ-3
(1.42)

SMOKING
SHELTER

PCY-300-MW03
(1.36)

TRANS-
FORMER

TRANS-
FORMER

SITE MANAGER: PEC	CHECKED BY: RCM
DRAWN BY: GMF	DRAWING DATE: 6/24/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1"=20'	
CAD DWG. NO.: 7540CM08	PROJ. NO.: 7540



Brown & Root Environmental

FIGURE 3-1
WATER-TABLE ELEVATION CONTOUR MAP
(APRIL 23, 1997)
SITE G300

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

GROUNDWATER FLOW VELOCITY

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone, assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \left(\frac{K}{n} \right) \times i$$

where:

V = average velocity

K = hydraulic conductivity = 10.24 ft/day

n = effective porosity (assumed) = 0.30

i = average hydraulic gradient = 0.01 ft/ft

therefore:

$$V = \left(\frac{10.24 \text{ ft/day}}{0.30} \right) \times 0.01 \text{ ft/ft}$$

$$V = 0.34 \text{ ft/day}$$

TRANSMISSIVITY

Transmissivity can be determined by multiplying the hydraulic conductivity by the effective aquifer thickness (b_e). The effective aquifer thickness is defined as depth to the top of the water table to (approximately 8 feet bls) to the top of a limestone of the Intracoastal Formation (encountered at CSS at depths of 48 feet and 63 feet bls) The transmissivity was calculated as follows:

$$T = Kb_e$$

where:

T = transmissivity

K = hydraulic conductivity = 10.24 ft/day

b_e = affected aquifer thickness = 48 ft

therefore:

$$T = 10.24 \text{ ft/day} \times 48 \text{ ft}$$

$$T = 4.92 \times 10^2 \text{ ft}^2/\text{day} \times 7.48 \text{ gal/ft}^3$$

$$T = 3.68 \times 10^2 \text{ gal/day/ft}$$

Note: Depth to Intracoastal Formation obtained from data presented in the RCRA Facility Investigation Report (ABB Environmental Services, Inc., 1995).

APPENDIX N
GROUNDWATER LABORATORY DATA SHEETS

Technical Report for**Brown & Root Environmental**

Site G300 CTO 0027

7540

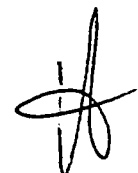
Accutest Job Number: F582

Report to:

C/O Paul Calligan
Brown & Root Environmental
1311 Executive Center Dr. Ste: 220
Tallahassee, FL 32301

ATTN: Arnold Lamb - QA Officer

Total number of pages in report: 35



Harry Behzadi, Ph.D.
Laboratory Director

Results relate only to the items tested.

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.

Sample Summary

Brown & Root Environmental

Date: 05/12/97

Site G300 CTO 0027

Job No: F582

Project No: 7540

Sample Number	Collected		Matrix Received	Code	Type	Client Sample ID
	Date	Time By				
F582-1	04/23/97	11:45 GG	04/25/97	AQ	Ground Water	300-MW03-001
F582-2	04/23/97	13:30 GG	04/25/97	AQ	Ground Water	300-MW04-001
F582-3	04/23/97	14:45 GG	04/25/97	AQ	Ground Water	300-MW01-001
F582-4	04/23/97	12:30 GG	04/25/97	AQ	Ground Water	300-MW03-001B
F582-5	04/23/97	15:30 GG	04/25/97	AQ	Ground Water	300-MW02-001
F582-6	04/17/97	16:00 GG	04/25/97	AQ	Trip Blank Water	TRIP BLANK

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001
Lab Sample ID: F582-1
Matrix: AQ - Ground Water
Method: EPA 8100
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01447.D	1	04/25/97	NF	04/25/97	OP83	GLJ68
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	10	ug/l	
208-96-8	Acenaphthylene	ND	10	ug/l	
120-12-7	Anthracene	ND	10	ug/l	
56-55-3	Benzo(a)anthracene	ND	10	ug/l	
50-32-8	Benzo(a)pyrene	ND	10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l	
218-01-9	Chrysene	ND	10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l	
206-44-0	Fluoranthene	ND	10	ug/l	
86-73-7	Fluorene	ND	10	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l	
91-20-3	Naphthalene	ND	10	ug/l	
90-12-0	1-Methylnaphthalene	ND	10	ug/l	
91-57-6	2-Methylnaphthalene	ND	10	ug/l	
85-01-8	Phenanthrene	ND	10	ug/l	
129-00-0	Pyrene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	74%		26-116%
84-15-1	o-Terphenyl	105%		26-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001
Lab Sample ID: F582-1
Matrix: AQ - Ground Water
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01591.D	1	05/02/97	NF	04/30/97	OP89	GU73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
---------	----------	--------	-----	-------	---

	TPH (C8-C40)	ND	0.50	mg/l	
--	--------------	----	------	------	--

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
---------	----------------------	--------	--------	--------

84-15-1	o-Terphenyl	84%		40-140%
---------	-------------	-----	--	---------

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-MW03-001		Date Sampled: 04/23/97	
Lab Sample ID: F582-1		Date Received: 04/25/97	
Matrix: AQ - Ground Water		Percent Solids: n/a	
Method: EPA 601/602			
Project: Site G300 CTO 0027			

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002006.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	2.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID: 300-MW03-001
Lab Sample ID: F582-1
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002006.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	93%		75-125%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001
Lab Sample ID: F582-1
Matrix: AQ - Ground Water
Method: EPA 504.1
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB01844.D	1	04/25/97	NF	n/a	n/a	GAB66
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW03-001	Date Sampled: 04/23/97
Lab Sample ID: F582-1	Date Received: 04/25/97
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: Site G300 CTO 0027	

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	<0.0030	0.0030	mg/l	1	05/02/97	05/08/97 JK	EPA 239.2

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW04-001
Lab Sample ID: F582-2
Matrix: AQ - Ground Water
Method: EPA 8100
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01448.D	1	04/25/97	NF	04/25/97	OP83	GIJ68
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	10	ug/l	
208-96-8	Acenaphthylene	ND	10	ug/l	
120-12-7	Anthracene	ND	10	ug/l	
56-55-3	Benzo(a)anthracene	ND	10	ug/l	
50-32-8	Benzo(a)pyrene	ND	10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l	
218-01-9	Chrysene	ND	10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l	
206-44-0	Fluoranthene	ND	10	ug/l	
86-73-7	Fluorene	ND	10	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l	
91-20-3	Naphthalene	ND	10	ug/l	
90-12-0	1-Methylnaphthalene	ND	10	ug/l	
91-57-6	2-Methylnaphthalene	ND	10	ug/l	
85-01-8	Phenanthrene	ND	10	ug/l	
129-00-0	Pyrene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	67%		26-116%
84-15-1	o-Terphenyl	97%		26-125%

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW04-001
Lab Sample ID: F582-2
Matrix: AQ - Ground Water
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01592.D	1	05/02/97	NF	04/30/97	OP89	GIJ73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	ND	0.50	mg/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	97%		40-140%
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ND = Not detected
 RDL = Reported Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates that analyte is found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-MW04-001
Lab Sample ID: F582-2
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002007.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	2.2	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID: 300-MW04-001
Lab Sample ID: F582-2
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002007.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	94%		75-125%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates that analyte is found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW04-001
Lab Sample ID: F582-2
Matrix: AQ - Ground Water
Method: EPA 504.1
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB01845.D	1	04/25/97	NF	n/a	n/a	GAB66
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
106-93-4	1,2-Dibromoethane	ND	0.020	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound



Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW04-001
Lab Sample ID: F582-2
Matrix: AQ - Ground Water
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By	Method
Lead	<0.0030	0.0030	mg/l	1	05/02/97	05/08/97 JK	EPA 239.2

RDL = Reported Detection Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW01-001
Lab Sample ID: F582-3
Matrix: AQ - Ground Water
Method: FLORIDA-PRO
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01595.D	2	05/02/97	NF	04/30/97	OP89	GU73
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
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	TPH (C8-C40)	3.95	1.0	mg/l	
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CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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84-15-1	o-Terphenyl	80%		40-140%
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ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: 300-MW01-001
Lab Sample ID: F582-3
Matrix: AQ - Ground Water
Method: EPA 8100
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	I01446.D	1	04/25/97	NF	04/25/97	OP83	GIJ68
Run #2							

BN PAH List

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	10	ug/l	
208-96-8	Acenaphthylene	ND	10	ug/l	
120-12-7	Anthracene	ND	10	ug/l	
56-55-3	Benzo(a)anthracene	ND	10	ug/l	
50-32-8	Benzo(a)pyrene	ND	10	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	10	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	10	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	10	ug/l	
218-01-9	Chrysene	ND	10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	10	ug/l	
206-44-0	Fluoranthene	ND	10	ug/l	
86-73-7	Fluorene	ND	10	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10	ug/l	
91-20-3	Naphthalene	33.6	10	ug/l	
90-12-0	1-Methylnaphthalene	18.0	10	ug/l	
91-57-6	2-Methylnaphthalene	24.1	10	ug/l	
85-01-8	Phenanthrene	ND	10	ug/l	
129-00-0	Pyrene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	67%		26-116%
84-15-1	o-Terphenyl	84%		26-125%

(a) All hits confirmed by dual column analysis.

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 2 of 2

Client Sample ID: 300-MW01-001
Lab Sample ID: F582-3
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002008.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	99%		75-125%

(a) Confirmed by reanalysis on MS

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 2

Client Sample ID: 300-MW01-001
Lab Sample ID: F582-3
Matrix: AQ - Ground Water
Method: EPA 601/602
Project: Site G300 CTO 0027

Date Sampled: 04/23/97
Date Received: 04/25/97
Percent Solids: n/a

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EF002008.D	1	04/25/97	AW	n/a	n/a	GEF50
Run #2							

VOA PPL List

CAS No.	Compound	Result	RDL	Units	Q
71-43-2	Benzene ^a	8.2	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
74-83-9	Bromomethane	ND	1.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
74-87-3	Chloromethane	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane ^a	2.1	1.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
100-41-4	Ethylbenzene ^a	11.1	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
1330-20-7	Xylenes (total) ^a	6.7	3.0	ug/l	
156-69-4	cis-1,2-Dichloroethene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

ND = Not detected

RDL = Reported Detection Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates that analyte is found in associated method blank

N = Indicates presumptive evidence of a compound